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THE UNIVERSITY OF ALBERTA

TEACHERS' ATTRIBUTIONS OF STUDENT ABILITY

by

SUSAN THERRIEN

A THESIS
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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled TEACHERS' ATTRIBUTIONS OF STUDENT ABILITY submitted by SUSAN THERRIEN in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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Abstract

The purpose of this study was to examine the effects of varying orders of pupil achievement information on teachers' attributions of pupils' abilities. Two ages of pupils were used as stimulus persons (SP's), a 5 year old male pupil and an 18 year old male pupil. Two orders of achievement information were used: ascending success (AS) and descending success (DS).

The subjects (S's) of the study were students who were studying elementary school education in the spring session courses at the University of Alberta. From 68 volunteers, a sample of 60 students was randomly selected, then the S's were randomly assigned to one of four treatment groups: Group I--child-pupil and ascending order; Group II--child-pupil and descending order; Group III--adult-pupil and ascending order; and Group IV--adult-pupil and descending order. The treatments consisted of video-taped presentations of SP solving ten problems. In each case subjects viewed the SP and a picture of each problem as it was being solved, and were provided success or failure information following each problem. Following the presentation of the tape, S's completed a questionnaire which asked them to predict the SP's success on ten additional problems, to recall his actual success rate, and to estimate his ability level. In addition they were asked to estimate the level of confidence with which they made their predictions and ability estimate. Subjects also completed a locus of control (Rotter, 1966) questionnaire and a cognitive complexity matrix (Bieri et al., 1966).

A two-way analysis of variance revealed a strong overall primacy effect of order of information on two of the three dependent variables: prediction and recall; and a significant but not as strong primacy effect on the third dependent variable: estimate of ability. A posteriori Scheffé tests revealed that for all dependent variables the primacy effect was stronger for the child-pupil conditions than for the adult-pupil conditions.

The correlations among the three dependent variables was negative and significant between prediction and estimate of ability, and was positive and significant between recall and estimate of ability.

Correlational analysis revealed that cognitive complexity was negatively and significantly related to degree of confidence, and was positively and significantly related to prediction.

As a unidimensional trait, locus of control was not significantly related to any of the dependent variables.

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CHAPTER I

INTRODUCTION TO THE INVESTIGATION

Since the publication of Rosenthal and Jacobson's research in 1968, a number of research studies have been designed to examine further the hypothesis that a teacher's expectations of a pupil may affect that pupil's classroom behavior. Twenty-five such studies reviewed by Baker and Crist (1971) have produced evidence supporting the "expectancy effect" hypothesis. However, little appears to be known about the mechanisms or processes producing the effect, or about the processes by which an expectancy is first established. Rosenthal and Jacobson (1968) induced teacher expectations artificially by providing I.Q. scores. Baker and Crist (1971) recommend the use of more "naturally occurring expectancies"[1] in further research. A great deal more needs to be known about how expectancies develop, what factors in the situation influence the development, and what characteristics of the individual teacher might influence the development of expectancies.

The purpose of this study was to examine teachers' perception of pupil behavior and their attribution of ability to the pupil based on their observations of his behavior. An attempt was made to discover whether the order of presentation of information about the pupil's problem solving behavior would induce erroneous perceptions of the behavior and biased attributions of ability. In addition, the effects of the age of the pupil on the teachers' attributions was examined.

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[1] Baker and Crist appear to use this term to mean those expectancies which are not induced by the experimenter. They have developed as a result of the setting in which teachers work and are perhaps stronger and more complex than induced expectancies.

Definitions

Attribution. The process by which an individual attributes causes to the behavior of others. The causes may be attributed to internal factors (intentions, dispositions, abilities) or external factors (luck, environmental factors).

Attribution of ability. The assignment of levels of ability to individuals based on observations of their behavior. In this study, three measures were used as indicators of attribution of ability: a prediction of future successes, a recall of observed success rate, and an estimate of ability level.

Primacy effect. The tendency for impressions to be influenced by initial information in a sequence of information presented. Susceptibility to a primacy effect results in impressions which are biased toward or colored by the early information in the sequence.

Locus of control. The degree to which an individual views events in his world as primarily internally or externally controlled. In this study, Rotter's (1966) I/E test was used to estimate locus of control.

Cognitive complexity. The degree to which an individual is capable of cognitive differentiation along more than one dimension. To estimate level of cognitive complexity the Bieri et al. (1966) Role Repertory Test was used.

Stage of professional development. The placement of a teacher in one of three sequential stages based on the professional concerns expressed. The Kass and Wheeler (1975) questionnaire was used to estimate stage of growth.

Ascending success. Increasingly successful problem solving by the pupil. The pattern of success/failure used to depict ascending success was as follows:

f f f s f s f s s s.

Descending success. Decreasingly successful problem solving by the pupil. The pattern used to depict descending success was as follows:

s s s f s f s f f f.

Stimulus person. The person whose behavior is being viewed by the subjects in the study. In this case two stimulus persons (SP's) were used: a 5 year old boy (child pupil) and an 18 year old boy (adult pupil).

Experimental Setting

Chapter III describes the experiment in full detail. A brief synopsis is presented here.

A sample of 60 education students at the University of Alberta was randomly drawn from a pool of volunteers, and subjects were randomly assigned to one of four treatment groups. The treatments consisted of video-taped presentations of a single pupil solving a sequence of ten problems. Each tape presented not only the pupil but also information about the problem he was solving and his success or failure in solving each problem.

Groups I and II viewed a 5 year old boy engaged in shape-pattern problems. The video tapes for the two groups were exactly the same except for the sequence of success/failure information inserted into the tape. Group I viewed an ascending order of success and group II a descending order.

Groups III and IV viewed an 18 year old boy engaged in solving analogy-like problems. Again, the tapes were exactly the same except for the order of success/failure information. Group III viewed ascending success and group IV viewed descending success. After viewing the tapes, subjects completed a questionnaire asking them to predict the pupil's success on each of ten similar problems, to recall the pupil's success rate on the video-tape, and to estimate the pupil's ability on an 11 point scale. In addition the subjects completed the Kass and Wheeler questionnaire, the Rotter I/E test and the Bieri Rep Test.

Limitations

The generalizations which can be made on the basis of this study are limited in several ways:

1. Though the intention of the study was to deal with an aspect of teacher behavior, the population from which the sample was drawn was comprised of education students some of whom had teaching experience. In addition, the sample was drawn from a pool of students who had volunteered for the study. Thus, the experimentally accessible population was not teachers in general, but rather students of education who volunteered. Generalizations to a teacher population must be made with caution.

2. The video-tapes which were presented to the subjects

depicted a single pupil engaged in a diagnostic testing situation. Thus the tapes presented only one aspect of pupil behavior in an educational setting and focused the subjects' attention on only one of many functions he might perform as a teacher. Generalizations on the basis of this study to other aspects of child behavior or other teaching functions must be made with caution.

Organization of the Chapters

The remainder of this dissertation is organized in the following way:

Chapter II: Review of the literature and statement of hypothesis. This chapter provides a summary of the literature in four areas:

1. Attribution theory
2. Attribution of ability
3. Primacy effects
4. Individual differences in the attribution process.

The chapter concludes with the hypotheses drawn from the literature which were tested in this study.

Chapter III: Research design and procedures. The research design and procedures are outlined.

Chapter IV: Primary analysis and results. The results are reported in relation to the primary hypotheses stated in Chapter II.

Chapter V: Secondary analysis and results. The results are reported in relation to the secondary hypotheses stated in Chapter II.

Chapter VI: Conclusions, implications and recommendations. The conclusions are listed and related to implications for teaching and teacher education, and recommendations for further research are outlined.

CHAPTER II

REVIEW OF THE LITERATURE AND STATEMENT OF HYPOTHESES

Attribution in Person Perception

Adequate understanding of a person's social behavior is dependent upon adequate understanding of how he perceives his social environment. Fritz Heider's efforts were directed toward understanding the way in which the individual perceives his social environment and how he organizes those perceptions (Heider, 1944, 1954 (a), 1954 (b), 1958).

Heider believes that human perceptions are organized into patterns which are stable and consistent. Without these patterns, the incoming sensory data would appear largely unrelated and uninterpretable.

> It is an important principle of common-sense psychology that. . .man grasps reality, and can predict and control it, by referring transient and variable behavior and events to relatively unchanging underlying conditions, to so-called dispositional properties of his world (Heider, 1958, p. 79).

Though Heider accepts object and person perception as being essentially governed by the same principles, he concentrates his writing on person perception.

> In person perception the manifold of incoming messages is encoded--or referred to, attributed to--the motives, sentiments, or beliefs of other persons (Heider, 1954 (b), p. 24).

Heider says that "Attribution serves the attainment of a stable and consistent environment (Heider, 1954 (b), p. 25)." Understanding a person's social behavior necessitates understanding the nature of the attributions he makes or causes he assigns to the behavior of others.

Attribution to Internal or External Causes

Attribution is "the linking of an event with its underlying conditions (Heider, 1958, p. 89)." These underlying conditions may be seen as internal to the persons being perceived or external, that is, in the environment.

> Of great importance for our picture of the social environment is the attribution of events to causal sources. . .attribution in terms of impersonal and personal cause (Heider, 1958, p. 16).

> . . .behavior can be ascribed primarily to the person or to the environment; that is, behavior can be accounted for by relatively stable traits of the personality or by factors within the environment. Failure, for instance, can be attributed to lack of ability, a personal characteristic, or to the supposition that the task is very difficult, an environmental condition (Heider, 1958, p. 56).

Research. Jones and Harris (1967) conducted a series of experiments to determine the influence of a stimulus person's stated opinions (expected vs. unexpected) and the degree of choice he could exercise in stating one opinion or another (high vs. low) on the subjects' estimates of the true attitude of the stimulus person.

Each subject stated his own attitude on the subject of Castro and Cuba, and then was presented with an essay written by the stimulus person. The essay was either pro-Castro or anti-Castro and the subjects were told whether the stimulus person had chosen his pro-Castro or anti-Castro stance or whether he had been instructed to use one stance or the other. Of interest here is the finding of Jones and Harris that when stimulus persons were seen as forced into expressing an opinion discrepant from that of subjects, the subjects still attributed the expressed opinion to internal or personal factors. In reviewing this study, Jones and Nisbett (1971) conclude that ". . .observers attach insufficient weight to situational determinants of behavior and attribute it, on slim evidence, to a disposition of the actor (Jones & Nisbett, 1971, p. 81)."

Two experiments (Johnson, Feigenbaum & Wieby, 1964; Beckman, 1970) examined teachers' attributions of causation based on successful and unsuccessful pupil behavior. The Johnson et al. (1964) study found that teachers actively involved in teaching two pupils would attribute pupil success to causes external to the pupils (namely, their own teaching behavior) but would attribute failure to causes internal to the pupil (ability and/or motivation) (Johnson et al., 1964, p. 237).

Beckman (1970) obtained the same results as the Johnson et al. study with one additional finding. In addition to subjects who were actively involved in teaching pupils, Beckman included a group of subjects who were observers to the teaching-learning situation. The observer-subjects' attributions were substantially different from the active-subjects' attributions. Whereas active-subjects attributed pupil success to themselves, observer-subjects attribute success to pupil ability (Beckman, 1970, p. 76). In commenting on this phenomenon, Jones and Nisbett (1971) suggest that the causal attribution made by the actor and the observer differs because "different aspects of the available information are salient for actors and observers (Jones & Nisbett, 1971, p. 85)." Beckman (1970) suggests that the active-subjects are more ego-involved than the observer-subjects and are consequently focusing more strongly on their own behavior than are the observer-subjects.

Implications for this study. From the studies cited above, and from the research discussed by Jones and Nisbett, four basic principles of attribution of causation can be stated:

1. Subjects display a tendency to attribute behavior to internal causes despite evidence of powerful external constraints.
2. Active participants attribute causes differently than observers.
3. Active participants attribute successful results to their own behavior and unsuccessful results to factors in the environment.
4. Observers attribute successful results to pupil ability or task difficulty level rather than teacher effectiveness.

In this study, these principles were incorporated in the following way:

1. Subjects of the study were observers only.
2. Attempts were made to maintain uniform task difficulty level to induce observers to focus on ability levels in their attributions.

Attribution of Ability

Two internal or personal forces to which success and failure may be attributed are power or ability to perform a task and intention toward or effort expended in accomplishing the task. Heider believes that individuals will more readily attribute success or failure to ability rather than effort. He states three reasons why this might be so (Heider, 1958, pp. 92-93):

1. Ability is clearly a personal or internal property of the individual, whereas the degree of effort expended may be dependent on environmental factors. For example, if an individual fails at a task, one might assume that the task was too easy, inducing boredom and lack of effort.

2. Ability is a dispositional construct which is viewed as stable, that is, enduring.

3. Ability is judged to be pervasive and subject to a "halo phenomenon". If an individual is judged able in one area he may be judged able in other areas.

Heider goes on to say that ". . .our reactions will be different according to whether we think a person failed primarily because he lacked adequate ability or primarily because he did not want to carry out the action (Heider, 1958, p. 123)."

Weiner et al. (1971) describes Heider's theory of attribution of ability in a four component model:

> We postulate that individuals utilize four elements of ascription both to postdict (interpret) and to predict the outcomes (O) of an achievement related event. The four causal elements are ability (A), effort (E), task

difficulty (T) and luck (L):

$$O = f\ (A, E, T, L)$$

(Weiner et al., 1971, p. 96).

The four elements may be distinguished from one another along two dimensions. Ability and task difficulty are viewed as stable, whereas effort and luck are unstable. Ability and effort are elements internal to the actor, whereas task difficulty and luck are controlled externally. Diagramatically the four elements and two dimensions would appear thus:

	locus of control	
stability	internal	external
stable	ability	task difficulty
unstable	effort	luck

Research. Freize and Weiner (1971) conducted two experiments in which subjects were asked to estimate the degree to which success and failure could be attributed to each of ability, effort, task difficulty and luck. Each subject was presented with 20 written descriptions of 20 different stimulus persons. The descriptions provided not only success/failure information but also described the stimulus person's past success rate on the given task, his past success rate on similar tasks, and the percentage of others succeeding or failing at the given task.

In the summary the authors describe the significant outcomes:

> . . .success is more likely to be attributed to internal factors (ability and effort) than is failure; consistency with the performance of others results in task ascriptions, whereas

inconsistency is attributed to ability, effort and luck; and consistency with one's own past performance is ascribed to ability and task difficulty, while inconsistent outcomes give rise to luck and effort attributions (Freize & Weiner, 1971, p. 605).

Weiner, Heckhausen, Meyer, and Cook (1972) conducted a study in which subjects made estimates of degree of effort needed to succeed on each of five tasks for which they were told the percentage of 20 individuals who had succeeded in each of the tasks. The authors concluded that the relationship between task difficulty and effort attribution is curvilinear. Difficult and simple tasks elicit attributions to other than effort. Attributions to effort are most likely when tasks are of intermediate difficulty.

Implications for this study. Two of the results reported above influenced the design of this study. The finding of Frieze and Weiner that consistency of performance results in attribution to ability and task difficulty suggest that a high correlation may exist between the recall of past success, the prediction of future success, and the estimation of ability, provided that task difficulty remains relatively constant. Thus this study included correlational analysis among prediction, recall and ability estimates.

The finding of Weiner et al. (1972) relating intermediate task difficulty to attribution of effort prompted the decision to evaluate not only the tasks a priori but also to include a measure of estimate of effort of the stimulus person.

Biases and Illusions in Attribution

Kelly (1967) describes the ways in which biases, illusions or errors enter the attribution process. He discusses four ways in which errors in attribution may come about:

1. Individuals may ignore relevant information in making an attribution. The complexity of the situation, for example, may overwhelm the perceiver such that he simply does not perceive some of the relevant information in the situation.

2. In the absence of complete information individuals make attributions based on ego-centric assumptions. Individuals tend to assume that others are like themselves. When observing a single occurrence of a behavior which provides very little data on which to base an attribution, the individual uses his knowledge about himself as additional data to interpret the behavior.

3. The affective consequences of behavior influence the attributions made by the observer of that behavior. For example, to protect his self-esteem, an individual may attribute stupidity to a person who disagrees with him. Kelly refers to a study by Walster which suggests that the more severe the consequences of an accidental event, the greater the tendency for individuals to attribute the causes to the person involved in the accident.

4. The surrounding situation may be misleading thus distorting the attribution. For example, the environment in which behavior takes place may suggest that the individual has freedom of choice when in fact he has none. An observer of the situation may attribute causes internal to the actor when in fact the causes of the behavior are environmental. Kelly suggests that this

occurrence is like figure-ground optical illusions in which the "figure" appears distorted when in fact the ground has been distorted.

In the first of the four points listed above, disregard for relevant information is the factor influencing the attribution. Not only the overload of information (suggested by Kelly) but also the order in which the perceiver receives the information may result in biased attributions due to selective attention to incoming information.

Order Effects in Attribution

Human behavior occurs in sequences, and therefore ". . .it is reasonable to ask whether the attribution process is in systematic ways affected by the order in which information is received (Jones & Goethals, 1971, p. 28)."

The effects of order of information may be of at least two kinds: a primacy effect or a recency effect. When information presented early in a sequence has the strongest influence on the perceiver a primacy effect biases his attribution. When the information late in a sequence more strongly influences the perceiver, a recency effect results. In either case, the perceiver ignores certain behavior and attends to other behavior in making his attribution.

Primacy effects. Why might early information be more influential in attribution than later information? Jones and Goethals (1971, pp. 42-43) suggest three possibilities: an attention decrement, a discounting tendency, and a distortion in assimilation.

Jones and Goethals use the term attention decrement to describe the behavior of a perceiver who attends closely to initial behavior and quickly forms an opinion. Once the opinion has been formed, the perceiver no longer attends to subsequent behavior. The authors suggest this "probably occurs to the extent there is cognitive overload (Jones & Goethals, 1971, p. 42)."

A discounting tendency is a tendency to ignore incompatible or incongruous information. Thus the perceiver keeps his first impressions intact by ignoring information which contradicts those impressions.

In the process of assimilating information the perceiver may distort information which is incompatible with his general impressions. This may be particularly true of ability attribution. Ability is generally viewed as stable and unchanging. Thus early information provides a basis for, or an anchor for, estimating ability. Then the later incompatible information is assimilated in a distorted form to agree with the early estimate.

Recency effects. Selective attention to information late in a sequence may result from recall readiness (Jones & Goethals, 1971, p. 43). One would expect that immediate past experiences would be recalled better than more remote experiences. This depends on how remote the early experiences were, and how close the recent events were in relation to the time at which the attribution occurs.

When short time spans are involved, the authors suggest that the degree of contrast between remote and recent information may induce recency effects. The greater the contrast, the more likely a recency effect.

In addition, the authors suggest that certain content or context hypotheses held by the perceiver about the entity under observation may result in a recency effect. An example of a content hypothesis is presented by the authors: "If the entity is known to be capable of progressive changes or development, its later manifestations are obviously more significant than earlier manifestations. . . (Jones & Goethals, 1971, p. 44)."

An example of a context hypothesis might be a situation in which the perceiver holds a set of beliefs about "test learning". This belief induces them to view a testing situation as one in which the SP learns (and thus improves) as he proceeds through a test. Thus the perceiver may focus on later information in making judgements about achievement, for example.

Research: Primacy effects. The dominance of primacy effects in impression formation, and the success of attempts to minimize the effects are well illustrated in the research of Luchins (1957 (a), 1957 (b), 1958).

Three sets of experiments were conducted by Luchins. In all experiments, subjects read two paragraphs which described the stimulus person, Jim. One paragraph contained evidence of Jim's extrovert behavior (E block) and the other described his introvert behavior (I block). In the first set of experiments (1957 (b)) subjects read both blocks of information in either EI order or IE order, and then completed a questionnaire in which they were asked to state their impressions of Jim. The results indicate a primacy effect. Subjects' impressions were significantly influenced by the first block of information which they read.

Luchins then designed two sets of experiments in which attempts were made to minimize the effects of first impressions (1957 (a); 1958). In these experiments Luchin introduced a "prior warning" to one group of subjects, telling them to beware of first impression effects, and an "interpolated warning" to another group who received the same caution but between the reading of the two paragraphs. A third group was involved in solving number problems between the reading of the two blocks of information. "The interpolated warning and interpolated number tasks were more effective in weakening primacy than advanced warning (Luchins, 1957 (a), p. 70)." Not only was the primacy effect eliminated but recency effects resulted. Because the number tasks created the greatest movement away from primacy and toward recency, the experimentor hypothesized that the delay time between information blocks may have been the effective factor not the content of the intervening time. To test this hypothesis, Luchins repeated the experiment allowing one group five minutes of a history lecture between information blocks and another group 17 minutes of history. His conclusion was that the greater the intervening time, the greater the recency effects.

In a third set of experiments, subjects were required to answer a questionnaire about "Jim" between information blocks as well as after both information blocks. The results indicate that an interpolated questionnaire relevant to the information being presented is more effective in blocking primacy effects than either an interpolated warning or irrelevant tasks. Luchins suggests that, in life-like situations, "one way of avoiding the fallacy of undue attention to earlier information is to formulate explicitly one's impression of the person. . .after receiving early information (Luchins, 1958, p. 289)."

Anderson and Hubert (1963) conducted a study in which subjects stated cumulative impressions after hearing a list of six or eight personality trait adjectives. The results indicate that asking subjects to recall the adjectives (both warned recall, unwarned recall) reduced the primacy effect which had been found in the no-recall condition. The authors surmise that the "attention decrement" was overcome by the recall tasks. However, the primacy effect was reduced even for those subjects who could not recall the adjectives. Thus Anderson and Hubert conclude that ". . .impression memory is distinct from verbal memory for the adjectives (Anderson & Hubert, 1963, p. 391)."

Stewart (1965) found that when the cumulative impression was formed at the conclusion of the reading of personality trait adjectives, a primacy effect resulted. When the cumulative impression was formed after each successive adjective, a recency effect resulted. The results were the same regardless of the number of adjectives in the sequence.

Primacy Effects in the Attribution of Ability

The studies cited above dealt mainly with order effects in forming personality impressions. In all cases, the impressions were formed on the basis of written material about the stimulus person. Jones, Rock, Shaver, Goethals and Ward (1968) conducted a series of experiments which presented a stimulus person either in person or on film, and which dealt with the attribution of intellectual ability. They were interested in the effects of varying orders of success and failure on the attributions of intellectual ability.

Each of the six experiments differed slightly from the others, but all were essentially the same in design. A stimulus person (either live or on film) attempted to solve 30 multiple choice problems and her success or failure in solving each problem was conveyed to the observing subjects after each problem. The independent variable was the order of success/failure information. The dependent variables, each accepted by the researchers as indications of attribution, were of three kinds:

1. Subjects were asked to predict the SP's success rate on 30 similar problems.
2. Subjects were asked to recall the actual success rate they had observed.
3. Subjects were asked to estimate the level of intellectual ability of the stimulus person.

The results indicate that a strong primacy effect operated in the attribution of ability. If the stimulus person was initially successful and had a descending pattern of successes, the subjects predicted greater future success, recalled a higher success rate, and estimated higher ability levels than when the stimulus person was initially unsuccessful, with an ascending success rate. The introduction of a recall measure did not appear to dilute the primacy effect as it had in the Anderson and Hubert personality trait study.

Implications for This Study

In nearly all the studies cited so far, the stimulus person was an adult, close in age to the subjects themselves. Since teachers are concerned with the growth of intellectual capabilities in their pupils and since preschool and elementary school pupils are considerably younger than their teachers, it seems reasonable to ask if the results of the Jones et al. (1968) study would be replicated in a situation where the subjects are teachers and the stimulus persons are children. The purpose of this study was to examine just such a question.

Individual Differences in Attribution

Little theoretical work has been done on the relationship between characteristics of the perceiver and the attributions he makes. However, two hypothetical constructs found in the literature have stimulated research to establish a connection between the nature of the perceiver and the nature of the attribution process. The two constructs are cognitive complexity and locus of control.

Cognitive Complexity

In considering cognitive characteristics of a perceiver, a wide variety of variables could be considered as relevant to the attribution process, such variables as intelligence, reasoning ability, and creativity. Bieri, Atkins, Briar, Leaman, Miller and

Tripodi (1966) chose to focus on the potential influence of the complexity of the perceiver's cognitive system. Bieri et al. cite several hypothetical constructs of a similar nature which have been developed by other theorists (for example Piaget's schemata, Tolman's cognitive mapping). The authors declare their conceptualization of cognitive structure to be derived from Kelly's (1955) theory of personal constructs, and to be related to the work of Witkin et al. (1962) on psychological differentiation and Harvey, Hunt and Schroeder's (1961) work on developing cognitive structures

> . . .cognitive complexity is a construct which is intended to indicate something about the person's structuring of his social world.
>
> Cognitive complexity may be defined as the capacity to construe social behavior in a multidimensional way.
>
> We can begin to identify the nature of this structural variable by noting that cognitive complexity is intended to reflect the relative differentiation of a person's system of dimensions for construing behavior (Bieri et al., 1966, p. 185).

Thus a cognitively complex individual has available to him a wide variety of dimensions of judgements and a greater capability for differentiating within the dimensions. Joyce and Weil (1972) summarize (from the work of Harvey, Hunt & Schroeder, and Schroeder, Driver & Streufert) the characteristics of the cognitively simple and complex individuals in the following way (p. 301, 302):

Low complexity: categorical black-white thinking
fast closure to minimize conflict

High Complexity: ability to compare and relate different
systems of interacting variables
tracking the environment in many ways

Bieri et al. say ". . .the more complex judge has available a greater repertory of construct dimensions along which to construe others (Bieri et al., 1966, p. 13)."

Research. A variety of instruments are available for the measurement of cognitive complexity.

Bieri and Blacker (1956) conducted a study to determine the generality of the cognitive-complexity construct in the perception of people and inkblots. The authors conclude that level of complexity (as measured by the Bieri Test of Cognitive Complexity) is significantly related to level of complexity (as measured by an analysis of the determinants and content of responses on a modified Rorschach Test).

Vannoy (1965) conducted a study to determine the generality of the construct, as measured by 20 tests of complexity. Factor analysis was used to determine the degree to which test intercorrelations would indicate the presence of one or more underlying factors.

Examining the variety of test loadings on the eight factors leads to three tentative conclusions about cognitive complexity as measured by the Bieri Test of Cognitive Complexity:

1. Cognitive complexity is inversely related to resistance to control from external sources, and corresponds with a lack of differentiation of the social environment.

2. Cognitive complexity is inversely related to tolerance for trait inconsistency.

3. Cognitive complexity is inversely related to extreme task orientation and inordinate concern with the competence of others.

Four studies have been conducted to determine the relationship between cognitive complexity and attribution. Streufert and Streufert (1969) examined the effects of success and failure on the attribution of causality. They found that subjects attributed increasing success to their own efforts, but did not take similar credit for decreasing success. The Sentence Completion Test (SCT: Schroeder) was used as the measure of cognitive-complexity. The researchers concluded that "The effect of success and failure on attribution of causality, and with it the effect on attitudes, was more pronounced for simple than for complex subjects (Streufert & Streufert, 1969, p. 138)."

Rosenkrantz and Crocker (1965) found that high complexity males reported less univalent final impressions than did low complexity males. No such finding was reported for females.

Mayo and Crockett (1964) found that cognitively complex subjects were ambivalent in their final impressions whereas cognitively simple subjects were very univalent in their impressions.

Petronko and Perin (1970) conclude that cognitively simple subjects are unable to incorporate disparate information into a final impression. Rather they focus either on earlier or more recent information in forming their impression.

Implications for this study. Cognitive complexity appears to be related to impression formation and the primacy or recency effects in personality trait impressions. One of the purposes of this study was to examine the relationship between the attribution of ability and the cognitive complexity of the individuals.

Since the cognitively complex individual sees behavior of others as multidimensional and is likely to be able to tolerate discrepant information to a greater degree than the cognitively simple individual, it was expected that the complex individual would be less susceptible to a primacy effect and would be less confident of his predictions and estimates of ability. Bieri's test was used to estimate cognitive complexity.

Locus of Control

Some individuals believe events occur mainly as the result of "luck, chance, fate, as under the control of powerful others (Rotter, 1966, p. 1)." Rotter has labeled this a belief in external control. However, if the events are seen as contingent on one's own behavior, Rotter has called this a belief in internal control. The belief held by an individual enters into social learning situations as a generalized expectancy or set.

Feather (1967) was unable to establish a link between perceived locus of control and attribution of success failure to internal or external causes. Feather concludes that "In less structured situations where cues about responsibility are not quite so evident, a person's general expectation about control might play a more important role in determining how he attributes responsibility for the event (Feather, 1967, p. 384)."

Implications for this study. Individuals who have a generalized expectation that one's own actions are the major determiner of the events around him, would more logically expect ability and motivation to be the prime factors in attribution of success and failure. The individual who sees events as more externally controlled may be less likely to focus on ability or motivation, and more likely to focus on luck or task difficulty--both external to the individual. It is expected that the more "internal" the person the greater the ability and motivation estimates. The Rotter IE Test was used to estimate internal/external locus of control.

Summary

A summary of the literature related to this study is contained in the following six points.

1. Heider believes that, in organizing perceptions of others, human beingsanchor their perceptions to underlying stable causes. The attribution to causes may be made to internal (personal) causes or to external (impersonal) causes. Experimental work has revealed a tendency to attribute actions to internal causes even in the face of evidence of external causes.

2. Causal attribution differs depending on the level of ego-involvement. Observers more frequently attribute causes to the actor, while actors attribute causes to the environment. This is particularly so in the case of assigning the causes of failure.

3. Success and failure may be attributed to ability, luck, effort or task difficulty.

4. Attribution of ability appears to be affected by the order of presentation of the success/failure information. A primacy effect results when the information is presented in a continuous sequence. When the sequence is interrupted, either by irrelevant activity or by forced interim impression formation, the primacy effect is either weakened or a recency effect results.

5. When adults are viewing the problem solving behavior of other adults, the attribution of ability is affected by a primacy effect.

6. Both the cognitive complexity of the individual and the perceived locus of control may affect the attributions he makes.

Research Hypotheses

The purpose of this study was to examine teachers' attributions of children's ability, and the possible relationship between attribution and several individual characteristics.

In the presentation of the hypotheses of this study, the more general research hypotheses present the expectations based on the literature. Each research hypothesis is followed by the more specific experimental hypothesis stated in conventional null form. The hypotheses are organized in two groups: primary hypotheses and secondary hypotheses.

Primary Hypotheses

Research hypothesis. The order of presentation of success/failure information affects the subjects' prediction of future success, his recall of successes, and his estimates of ability in a primacy direction.

Experimental hypotheses.

Ho_1: Subjects' predictions of success do not differ significantly between the ascending success and descending success conditions.

Ho_2: Subjects' recall of success scores do not differ significantly between the ascending success and descending success conditions.

Ho_3: Subjects' estimates of ability do not differ significantly between the ascending success and descending success conditions.

Research hypothesis. The age of the stimulus person does not affect the subjects' prediction of success, recall of success, or estimate of ability. In addition, no interaction between order effects and age difference effects are expected.

Experimental hypotheses.

Ho_4: Subjects' predictions of success do not differ significantly between the child-pupil and adult-pupil condition.

Ho_5: Subjects' recall of success scores do not differ significantly between the child-pupil and adult-pupil conditions.

Ho_6: Subjects' estimates of ability do not differ significantly between the child-pupil and adult-pupil conditions.

Ho_7: There is no significant interactions between ascending/descending conditions and age of pupil conditions for any of the three dependent variables.

Research hypothesis. Since prediction of success, recall of success, and estimate of ability are each considered to be evidence of overall attribution of ability, and since subjects view past and present behavior as consistent with the stable underlying ability of the stimulus person, a high correlation should exist among these measures.

Experimental hypothesis.

Ho_8: There are no significant correlations among prediction of success, recall of success and estimate of ability.

Secondary Hypotheses

Research hypothesis. The theoretical and research literature provides a basis for suspecting that cognitive complexity is inversely related to susceptibility to primacy effects and confidence in the impressions formed.

Experimental hypotheses.

Ho_9: There is no significant correlation between cognitive complexity and susceptibility to primacy on each of prediction, recall, and estimate of ability.

Ho_{10}: There is no significant correlation between cognitive complexity and degree of confidence.

Research hypothesis. An individual's belief about locus of control will influence his estimate of motivation. The more external the individual, the more he will attribute the causes of behavior to factors external to the SP. Since this study did not deal directly with external vs. internal causality, the degree of motivation estimated was used as the indicator of internal vs. external causality. The more external the individual, the lower will be his estimate of motivation.

Experimental hypothesis.

Ho_{11}: There is no significant correlation between the degree of externality of locus of control and estimate of motivation.

Research hypothesis. Factors of age, sex, experience with children, type and extent of teacher education, and stage of professional growth may be related singly or in combination to attribution of ability.

Experimental hypothesis.

Ho_{12}: There are no significant correlations between susceptibility to primacy and any of the following: sex, age, experience, type of program and year of program.

CHAPTER III

RESEARCH PROCEDURES

In order to test the hypotheses stated in the conclusion of Chapter II, the research design would have to fulfill a number of requirements:

1. A manner of presenting pupil behavior in a realistic yet controlled fashion had to be devised. Since order of presentation and age of pupil were two variables to be examined (in a 2 x 2 factorial design) both of these characteristics had to be manipulable in the presentation of the pupil behavior. In addition, the kind of pupil behavior presented had to be related in some way to intellectual abilities since subjects would be asked to estimate ability.

2. A means for assessing subjects' perceptions of the pupil and their attributions of the pupil's ability had to be constructed.

3. To examine the relationship between individual characteristics of the subjects and the attribution processes, a means for selecting the characteristics and gathering relevant data had to be developed.

4. Since the study was to deal with an aspect of teaching behavior, an appropriate target population and means for sampling from that population had to be determined.

Decisions Concerning Design

Presentation of Pupil Behavior

There were many ways in which the behavior of the stimulus persons (in this case, pupils) could have been presented. The desire to present the behavior realistically led to consideration of video-tape as the mode of presentation. An examination of the research literature revealed that, in a series of studies reported by Jones et al. (1968), sound film was used in the second and subsequent experiments to present the behavior. Comparing the first experiment (which presented live behavior) with the remaining five, no differences in the results could be attributed to the use of film rather than live behavior. The film also provided the researchers with a means for presenting the tasks or problems being solved by the SP's by overdubbing each problem on the bottom of the screen so the stimulus person and problem could be viewed simultaneously.

On the basis of the Jones et al. studies, video-tape was selected as the means of presenting the pupil behavior in this study. Video-tape would make possible the presentation of the pupil behavior, the simultaneous presentation of the problem being solved by the pupil, and the presentation of success/failure information through editing and inserting tape segments. In addition, editing would make possible the manipulation of order of success/failure information without changing the order of problems being presented.

Type of Pupil Behavior Presented

The Jones et al. (1968) study cited above described the criteria for selecting the tasks performed by the SP in any study dealing with attribution of ability. Two of the criteria are stated thus ". . .the performance tasks are discrete and factors of learning are therefore minimized. . .and the tasks appear to be measures of some basic ability (Jones et al., 1968, p. 340)."

The behavior chosen for presentation to the subjects in this study was problem solving behavior. The problems were selected to demand three cognitive processes of the SP: examination of the details of information presented in the problem; the development of a generalization about relationships among these details; and the selection of a solution (from four given possibilities) which would fit the hypothesized generalization. A fuller description of the actual problems and their selection appears later in this chapter.

Development of Criterion Measures

In a general discussion of order effects in attribution, Jones and Goethals (1971) discuss the means for gathering data on subjects' attributions:

> . . .general evaluative ratings can serve as useful measures of the effect of order.
>
> . . .If the investigator has doubts about the reliability and validity of simple ratings of, say, intelligence, he can ask the subject to predict the target person's performance on a relevant subsequent task.
>
> . . .it would seem almost mandatory to insert somewhere in the design a measure of recall. . .Distortions in memory in a primacy or recency direction can obviously affect attribution when, as is usually the case in the order effect paradigm,

items are systematically arranged to convey different information at the beginning than at the end (Jones & Goethals, 1971, p. 29).

For this study, three measures were constructed:

1. Subjects were presented with ten problems similar to those viewed on the tape and were asked to predict the SP's success or failure on each problem.

2. Subjects were asked to recall the number of successful solutions they viewed on the tape.

3. Presented with an 11 point scale, subjects were asked to estimate the pupil's ability.

On measures one and three, subjects were also asked to state (on a five point scale) the confidence with which they made their predictions and estimates. One further question dealt with the degree to which they felt that the pupil was motivated.

Selection of Individual Characteristic Measures

Little of the research on attribution has dealt with individual differences among subjects as a variable. Three measures were selected for use in this study: a measure of cognitive complexity (Bieri Rep Test, 1966), a measure of locus of control (Rotter I/E Test, 1966), and a measure of teacher professional growth (Kass & Wheeler, Teacher Concerns Questionnaire, 1975). In addition the following demographic data were collected: age, sex, level of experience with children, and level of teacher preparation.

Population and Sample

Education students at the University of Alberta were selected as an experimentally accessible target population. This group would include a wide variety of ages, degrees of experience, and levels of education. Yet these people would differ from other university students in that they would all be studying education. No mechanism was available to require students to participate in the study so the decision was made to solicit volunteers from whom a sample of 60 would be randomly selected.

Construction of the Treatment Video-Tapes

Construction and Selection of Tasks

In the preparation of the treatment video-tapes and the "prediction" criterion measure, a set of tasks appropriate for a child-pupil and a set appropriate for an adult-pupil were required. Twenty tasks (ten adult and ten child) were needed for the video-tapes, and 20 (again ten of each) for the criterion measures.

The tasks or problems were developed and selected keeping in mind the statement of Jones et al.:

> We believe that the primacy-recency phenomena we have observed will hold true in a wide variety of performance situations, provided that: (a) the performance tasks are discrete and factors of learning are therefore minimized, (b) the difficulty level of the tasks remains roughly constant throughout, and (c) the tasks appear to be measures of some basic ability (Jones, Rock et al., 1968, p. 340).

In addition, the adult tasks and child tasks were constructed so as to demand a similar sort of thinking process of both the adult-pupil and the child-pupil. For the adult-pupil the problems took the form of analogies and for the child-pupil, the problems were pattern continuation problems.

Initially two pools of 30 problems each were constructed to conform to the following criteria:

1. No problem required knowledge of highly specialized or technical vocabulary.

2. The solution to each problem would be selected from four possible solutions.

3. The problem format included only problems requiring completion. That is, the selected solution would be placed at the end of the problem, not at the beginning or middle.

4. Every problem had only one possible correct solution.

The complete pools of 30 problems each appear in Appendix A.

In order to insure that the problems to be used were of roughly constant difficulty levels, each set of tasks was submitted to eight judges[1] who were instructed to select the three most difficult and three least difficult from each set. A frequency table of the results (Appendix B) provided the basis for selecting the final 20 problems within each pool. Any task which was cited by three or more judges as being most or least difficult was discarded from the pool of problems. The remaining 20 problems in each set were randomly assigned to be used as either treatment problems or criterion measure problems. The final selection and assignment appears in Appendix C. The order of appearance in the

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[1] The judges were graduate students in the Department of Elementary Education.

Appendix is the order in which the tasks were presented to the SP's and thus to the subjects.

In addition, two tasks from the discarded tasks in each set were selected to use as sample problems on the video-tape. They were chosen from those tasks identified by the judges as easy tasks.

Selection of Stimulus Persons

Two stimulus persons were required, each of a different age. Michael, an 18 year old pupil, was selected to play the role of a high school student who was being tested for vocational counselling. Spencer, a 5 year old boy, was chosen from the University Kindergarten to play the role of a child being tested prior to first grade entrance. In both testing situations, Mrs. Mallet, an experienced teacher, played the role of tester.

Michael was fully aware of the role which he was to play. However, Spencer, being much younger, was introduced to the video-tape machinery and then guided through the tasks at his own pace. He was not prompted to play any role other than that of being himself.

Video-Tape Construction

Each of the four treatments consisted of a video-tape presentation of a pupil engaged in problem solving. As previously stated, tapes one and two were of precisely the same content but for the sequence of success/failure information. The same was true of tapes three and four. The tapes were constructed in three stages.

Filming the pupils and tasks. A studio was set up in a self contained classroom which was empty except for two video cameras, a monitor and recorder, a special effects switcher, a low table and two chairs. One camera was constantly trained on enlarged pictures of the tasks and one camera focused on the pupil and tester who sat at the table and proceeded through the tasks. The special effects switcher made possible simultaneous recording of the tester and pupil on the top half of the screen and an enlarged picture of each task on the bottom half of the screen. Thus as the pupil began each task, a picture of the task appeared on the bottom of the screen, and as the pupil finished the task, the task picture disappeared from view.

Two recordings were made: one of 5 year old Spencer proceeding through the pattern problems and one of 18 year old Michael engaged in solving analogy-like problems. No sound was recorded at this point, and the actual solutions chosen by either pupil were not visible on the video-tape.

A third video-tape was made which contained segments of introductory graphics and segments with the words "successful" or "not successful".

Editing the four treatment tapes. From the video-tapes described above, four treatment tapes were constructed. Video-tape editing equipment enabled the interspersal of segments of "successful/not successful" information and segments of pupil problem solving and task pictures. Thus tapes one and two were made up of exactly the same sequence of pupil behavior and task presentation, and differed only in the order of the success/failure information inserted after the completion of each task.

The same is true for tapes three and four.

Dubbing in the sound. A narration was dubbed onto each of the four treatment tapes. The narration was kept as close to the same for each tape as possible except for the essential differences in success/failure information. The full script of the tapes appears in Appendix D.

Comments on the final tapes. The tapes were filmed and presented in black and white. Tapes one and two were 17 minutes long and tapes three and four were ten minutes long. The difference in length was primarily due to the 5 year old's talkativeness and slowness in the process of circling his solutions.

Instrumentation

The questionnaire which was used directly following the videotape presentation was made up of six parts. Appendix E contains the complete questionnaire. Pages five and six of the questionnaire varied depending on the age of pupil viewed by each treatment group.

Part I: Personal Information Questionnaire

Subjects were asked to record personal information by marking one or more boxes in each of the five categories. For the purposes of scoring, numbers were assigned to each box in the following way:

1. Age: 1 to 8 (from youngest to oldest categories)
2. Male = 1; Female = 2
3. Experiences: 1 to 5 (from "none" to "children of your own")
4. Program: 1 to 4 (from "B. Ed." to "M. Ed. or Ph. D.")
5. Year of Program: 1 to 4 (from "1st" to "4th")

The highest response only in category three was recorded. Any missing response was recorded as zero.

Part II: Pupil Performance Questionnaire

The first portion of this instrument requested subjects to examine each of ten problems, predict the pupil"s success by marking an "x" in the appropriate box, and to circle the number (five point scale) indicating the degree of confidence with which they made their prediction. A score of one was given for prediction of success and a score of zero for a prediction of failure. The actual numbers circled were used as scores for confidence levels.

On the second portion of the questionnaire subjects were asked to recall the number of successes achieved by the SP on the tape. Their recall score was the number (from 0 to 10) which they circled.

The third portion required that subjects estimate (on an 11 point scale ranging from "very low ability" to "very high ability") the pupil's ability and to indicate the degree of confidence with which the estimate was made. The actual numbers circled were used as the subjects' scores.

On the fourth part of this questionnaire subjects indicated the degree of motivation of the SP by marking an "x" in the appropriate box. The responses were scored from one to four (boxes three and four both scored three, and box five scored four).

The final portion was an open-ended question which allowed subjects to comment further on the SP's behavior. The responses were not analyzed.

Part III: Concerns About Teaching Questionnaire

The Kass and Wheeler (1975) questionnaire was used with the following modifications:

1. The category entitled "A continuing concern" was deleted, on the advice of Kass and Wheeler, in order to force a greater differentiation of responses than had been achieved in their study.

2. The wording of statements 5, 15 and 20 was modified slightly in order to use the questionnaire with subjects who were more familiar with elementary education.

3. The category "A major concern when I first started teaching" was modified to read "A major concern when I first started teacher education" in order to accommodate those subjects who had no teaching experience.

The scoring involved a frequency count for each category on each cluster of statements. The statements were designated as stage one, two or three based on the research of Kass and Wheeler. The statements clustered in the following way:

stage one cluster: statements 2, 3, 9, 11, 13 and 17.
stage two cluster: statements 1, 6, 7, 12, 16, 18 and 19.
stage three cluster: statements 4, 5, 8, 10, 14, 15 and 20.

A sample of the scoring sheet appears in Appendix F.

Part IV: Events Pattern Scale

The Rotter I/E Scale (1966) was disguised under the title "Events Pattern Scale". No modifications were made to the questions themselves and Rotter's original scoring procedure was used. Thus a high score represents a high degree of external locus of control.

Part V: Interpersonal Role Analysis Scale

The Bieri Rep Test was disguised under the title "Interpersonal Role Analysis Scale" and detailed instructions were constructed to guide subjects through the test. The test procedures and scoring procedures were not modified. A high score represents a high degree of cognitive complexity.

Part VI: Your Comments About the Study

Subjects were invited to express any of their thoughts about the study. These comments were not subjected to content analysis.

Sampling Procedures

A possible total of 210 education students were enrolled in seven spring session Curriculum and Instruction undergraduate courses at the University of Alberta. The experimenter met with each class, described the research as a study of observing pupil behavior and invited them to participate (see Appendix G for outline of information presented to the classes). The students were assured anonymity.

Sixty-eight students volunteered. From the 68, a sample of 60 was randomly selected then randomly assigned to one of the four treatment groups. Each selected student was informed about the time and place of the experiment and were assigned a group number. The forms used for contacting staff and students appear in Appendix H.

Administration of Treatments and Data Collection

Prior to the administration of the treatments, four graduate students from the University of Alberta were trained as assistants. They previewed the tapes and questionnaire, and were instructed in the procedures. Each assistant was assigned to a treatment group and informed of the time and place to be used for administration of treatments.

The subjects were assigned to four different rooms depending on their group number. Having entered the rooms they were cautioned not to speak during the session. At five minutes past the appointed starting time the doors were closed. The video-tapes were presented on Sony monitors.

Following completion of the questionnaires, all subjects met for debriefing. During the debriefing session the purposes of the study were revealed and questions answered.

Data Analysis

In order to test hypotheses Ho_1 to Ho_7, a two way analysis of variance with a posteriori Scheffé tests was carried out on each of the three criterion measures.

Correlations were obtained to test the remaining secondary hypotheses.

CHAPTER IV

PRIMARY ANALYSIS AND RESULTS

Of main interest in this study was the effect of order of information on teachers' attributions of children's ability. This chapter reports the analysis of the data pertinent to the primary hypotheses stated in Chapter II (p. 27).

Two sequences of achievement information and two age levels of stimulus person were used. A two way analysis of variance was carried out in order to examine both the main effects and to test for possible interaction effects. Correlations among the three criterion measures were calculated to examine the consistency among three related aspects of attribution.

Two Way Analysis of Variance

Each of the first seven hypotheses stated in Chapter II was tested through a two way analysis of variance.

Hypotheses: Prediction of Success

Ho_1: Subjects' predictions of success do not differ significantly between the ascending success and descending success conditions (Factor B).

Ho_4: Subjects' predictions of success will not differ significantly between the child-pupil and adult-pupil conditions (Factor A).

Ho_7: There will be no significant interactions between ascending/descending conditions and age of pupil conditions.

Results.

Source	S.S.	d.f.	M.S.	F-ratio	Probability
A (pupil)	.879774	1	.879774	.445523	.50767
B (order)	18.695786	1	18.695786	9.467653	.00345
AB	4.348388	1	4.348388	2.202048	.14436
error	94.785645	48	1.974701		

The statistical significance of the order effect was established. The direction of the order effect was determined by examining the table of means.

	B1(ascending)	B2(descending)
A1 (5 year old)	4.077	5.857
A2 (18 year old)	4.917	5.538

Information from the two tables indicates a significant primacy effect in the prediction of success. Hypothesis Ho_1 is rejected and hypotheses Ho_4 and Ho_7 have been accepted.

Hypotheses: Recall of Success

Ho_2: Subjects' recall of success scores do not differ significantly between the ascending success and descending success conditions.

Ho_5: Subjects' recall of success scores do not differ significantly between the child-pupil and adult-pupil conditions.

Ho_7: There will be no significant interactions between ascending/descending conditions and age of pupil conditions.

Results.

Source	S.S.	d.f.	M.S.	F-ratio	Probability
A (age)	.734773	1	.734773	1.304553	.25905
B(order)	19.868301	1	19.868301	35.275162	.00000
AB	.005261	1	.005261	.009340	.92341
Error	27.03540	48	.563237		

The statistical significance of the order effect was established. The direction of the order effect was determined by examining the table of means.

	B1 (ascending)	B2 (descending)
A1 (5 year old)	4.385	5.643
A2 (18 year old)	4.167	5.385

Information from the two tables indicates a significant primacy effect in the recall of successes. Therefore Ho_2 is rejected and Ho_5 and Ho_7 are accepted.

Hypotheses: Estimates of Ability

Ho_3: Subjects' estimates of ability do not differ significantly between the ascending and descending conditions.

Ho_6: Subjects' estimates of ability do not differ significantly between the child-pupil and adult-pupil conditions.

Ho_7: There is no significant interaction between ascending/descending conditions and age of pupil conditions.

Results.

Source	S.S.	d.f.	M.S.	F-ratio	Probability
A (age)	36.659668	1	36.659668	18.933334	.00007
B (order)	7.460922	1	7.460922	3.853287	.05546
AB	1.061468	1	1.061468	0.548209	.46266
Error	92.939941	48	1.936249		

The statistical significance of the age of pupil effect was established. The order effect approaches significance. The table of means indicates the direction of the effects.

	B1 (ascending)	B2 (descending)
A1 (5 year old)	5.385	5.857
A2 (18 year old)	3.417	4.462

Estimates of ability of the child-pupil were significantly higher than estimates of ability of the adult-pupil. Again, a primacy effect is indicated by the means.

The information in the two tables provides the basis for rejecting Ho_6. Hypothesis Ho_3 is also rejected but with less confidence. Ho_7 is accepted.

A Posteriori Comparisons: Scheffé

The Scheffé procedure (Winer, 1971) was used to compare individual groups in an attempt to locate the differences which contributed to the ANOVA results. At the suggestion of Edwards (1972 , p. 150) the α level was set at .90 to counteract somewhat the conservatism of the Scheffé test.

The results are reported in eight frequency graphs and tables.

The results of the Scheffé tests indicate that for the prediction of success variable (tables 1 and 2), the child-pupil condition accounted for the major portion of the order differences found in the analysis of variance. The differences between the adult-pupil conditions are in a primacy direction but do not reach statistical significance.

Tables 3 and 4 indicate that recall of success is significantly different (in a primacy direction) in both the child-pupil and adult-pupil conditions.

The child-pupil vs. adult-pupil differences in estimates of ability hold true across both ascending and descending conditions (figures 7 and 8). The primacy effect tendency noted in the analysis of variance results is weakened when individual groups are compared. The tendency is in a primacy direction but does not reach statistical significance in either comparison (tables 5 and 6).

Correlations Among Dependent Variables

Hypothesis

Ho_8: There is no significant correlation among prediction of success, recall of success and estimate of ability.

Results. A correlation matrix was produced to test the above hypothesis. Results appear in the table on page 57.

Though prediction and recall are not significantly related, both recall and prediction are related to ability estimates. Recall correlates positively with ability estimate. Prediction however,

Figure 1

Prediction of Successes

(Comparison between child-pupil ascending group 1 and child-pupil descending group 2)

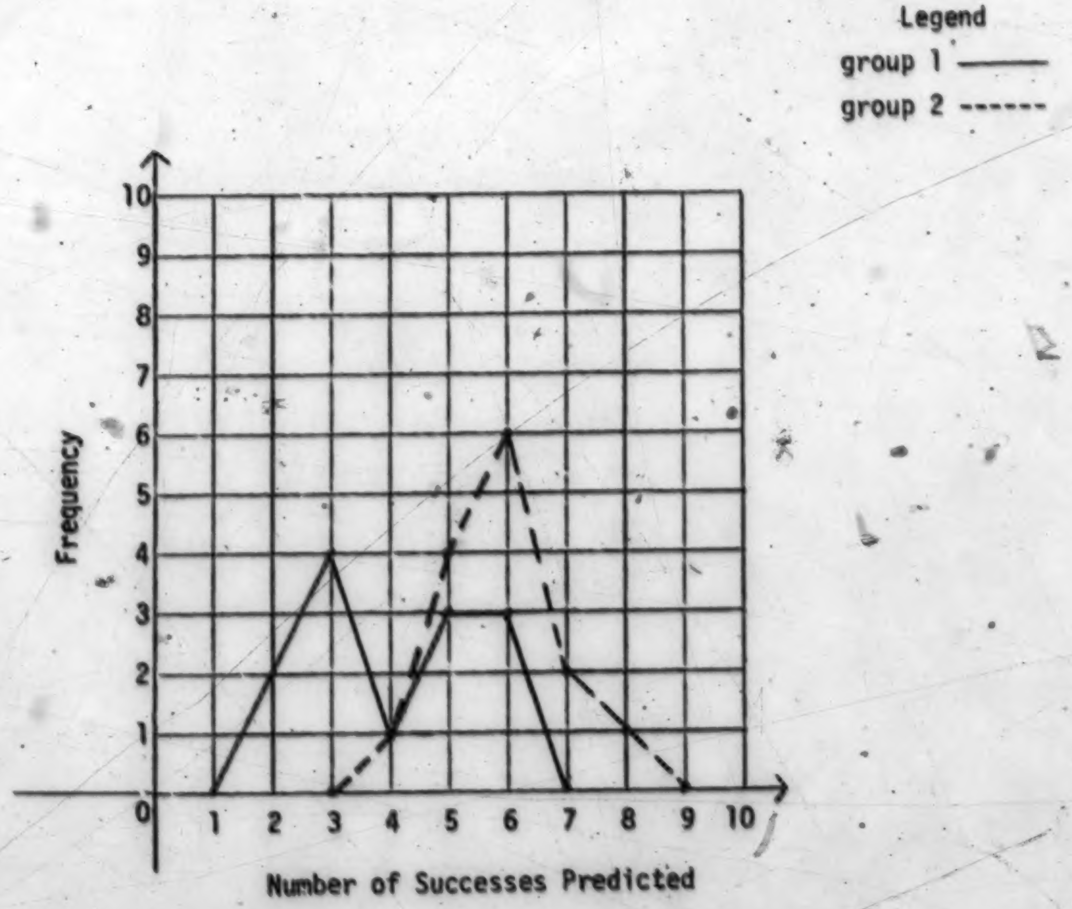


Table 1

	mean	S.D.	(Scheffé) F obs	F critical
group 1 n = 13	4.077	1.498	10.8155	6.69
group 2 n = 14	5.859	1.027		

Figure 2

Prediction of Success

(Comparison of adult-pupil ascending group 3 and adult-pupil descending group 4)

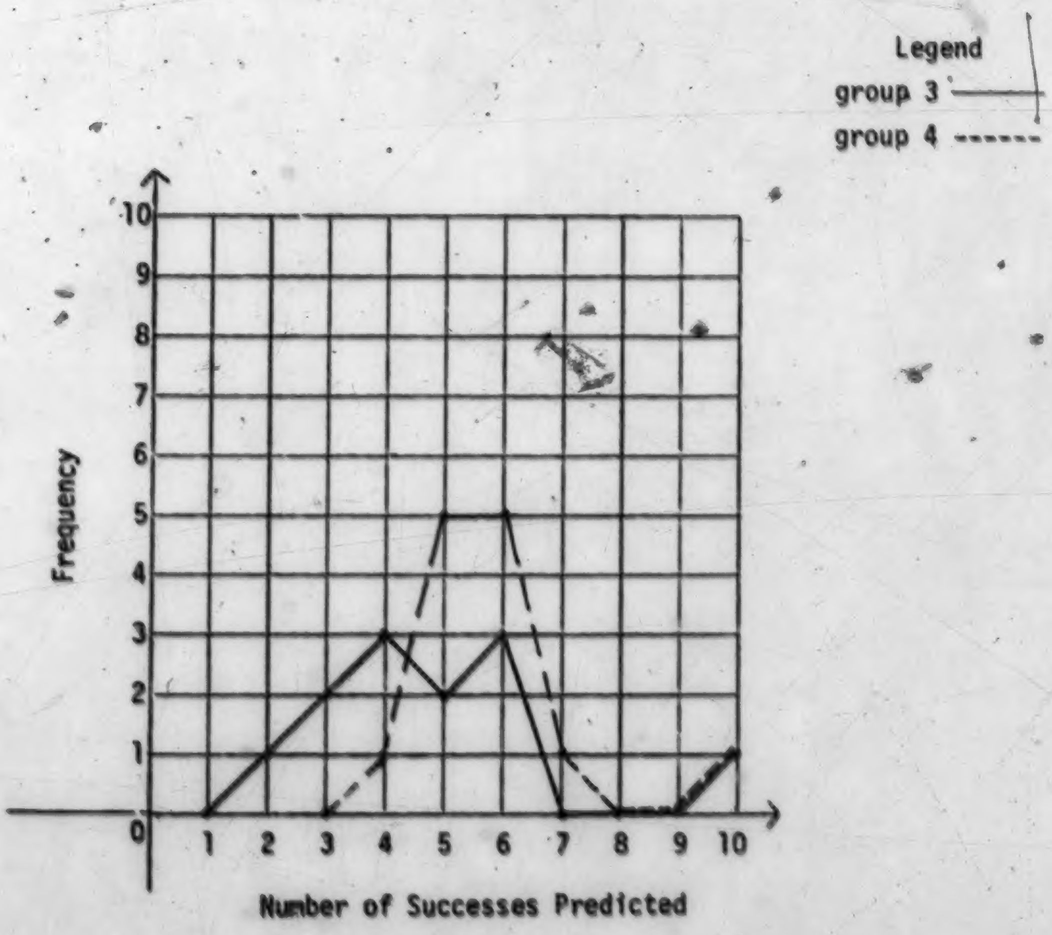


Table 2

	mean	S.D.	(Scheffé) F obs	F critical
group 3 n = 12	4.917	2.021	1.2186	6.69
group 4 n = 13	5.538	.877		

Figure 3

Recall of Successes

(Comparison of child-pupil ascending group 1 and child-pupil descending group 2)

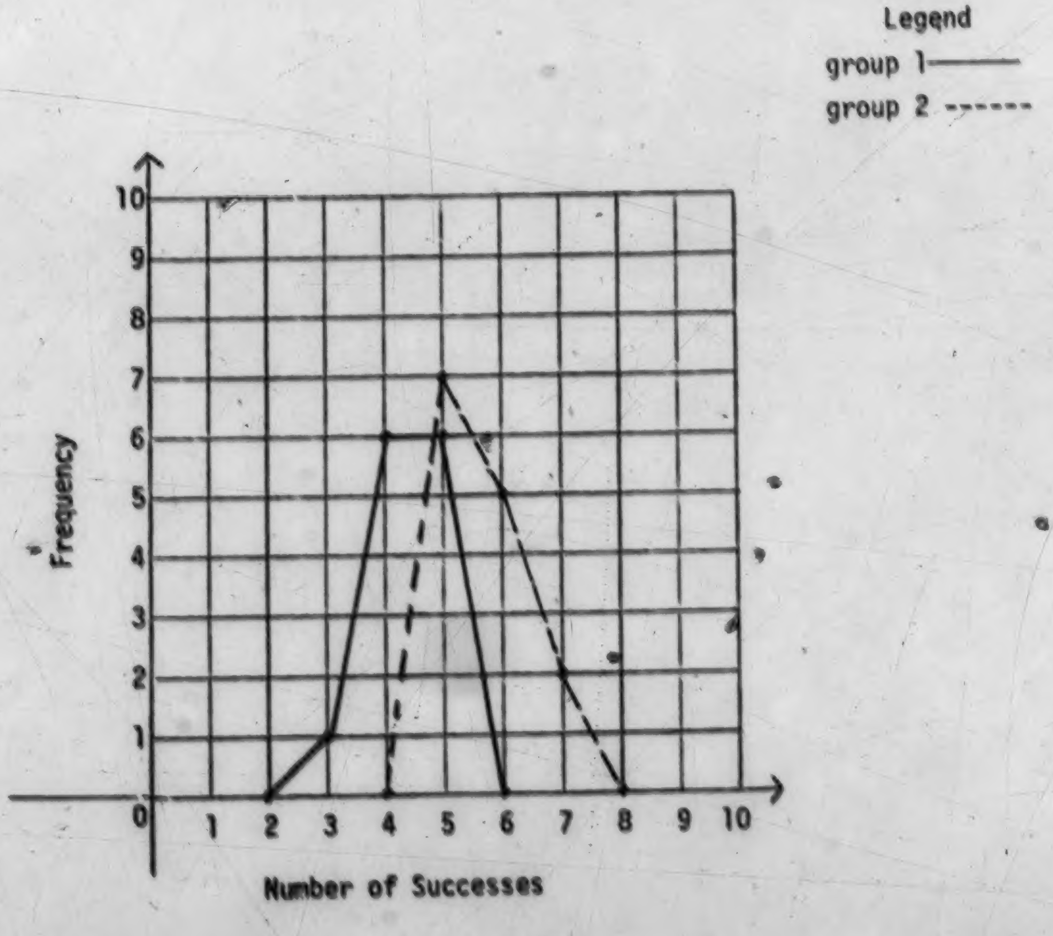


Table 3

	mean	S.D.	(Scheffé) F obs	F critical
group 1 n = 13	4.385	.6504	18.9419	6.69
group 2 n = 14	5.643	.7450		

Figure 4

Recall of Success

(Comparison of adult-pupil ascending group 3 and
adult-pupil descending group 4)

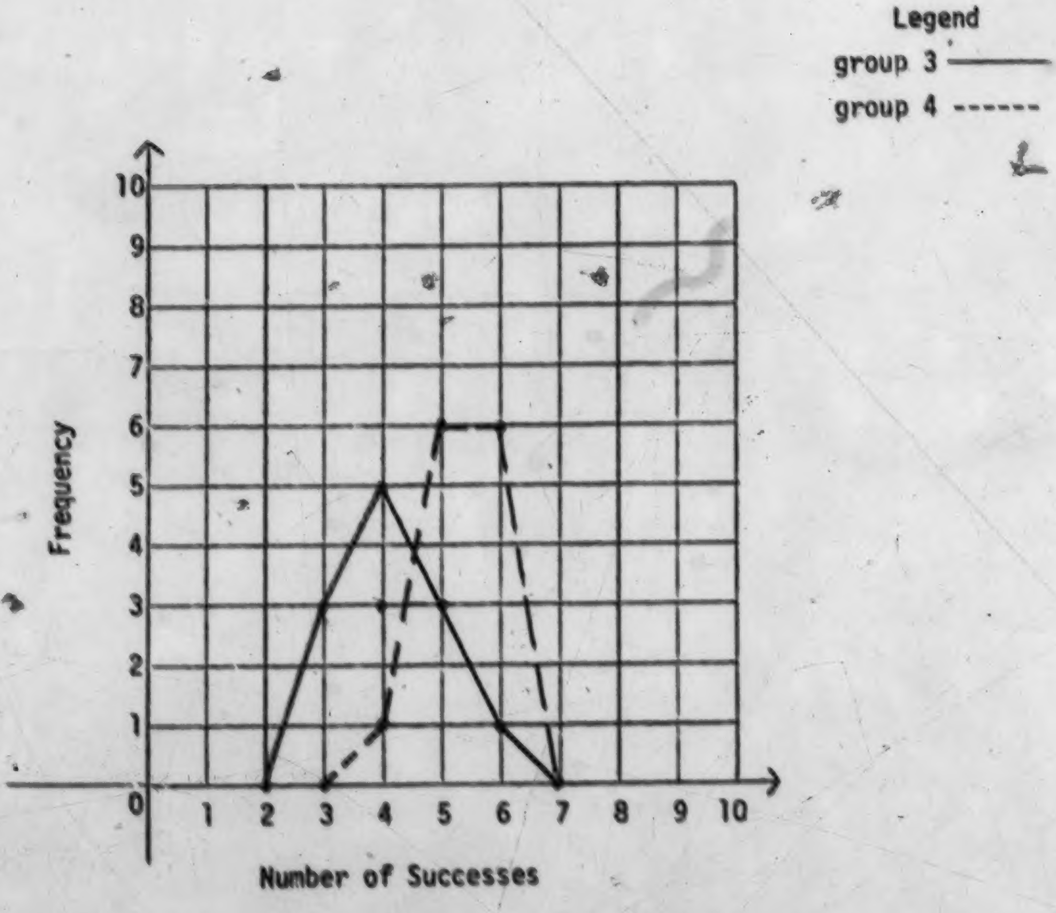


Table 4

	mean	S.D.	(Scheffé) F obs	F critical
group 3 n = 12	4.167	.9375	16.4377	6.69
group 4 n = 13	5.385	.6504		

Figure 5

Estimate of Ability

(Comparison of child-pupil ascending group 1 and
child-pupil descending group 2)

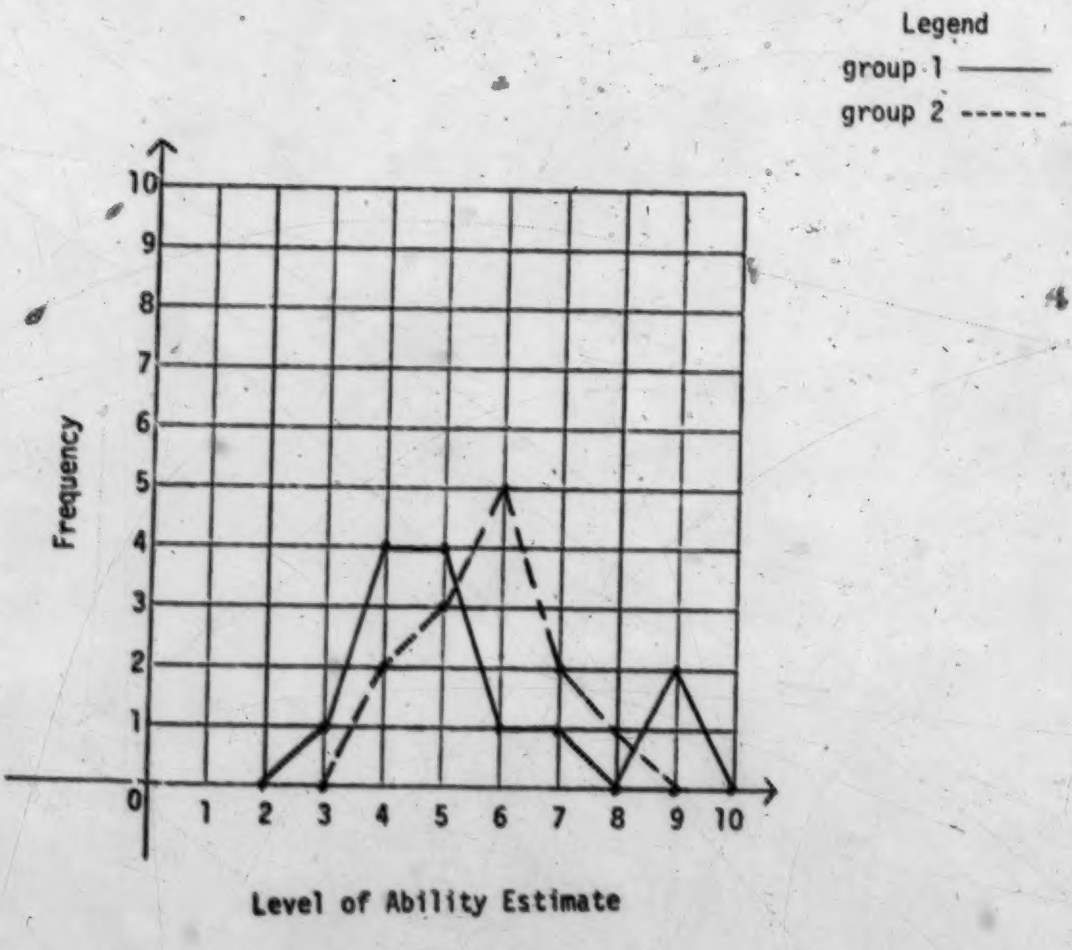


Table 5

	mean	S.D.	(Scheffé) F obs	F critical
group 1 n = 13	5.385	1.894	.7758	6.69
group 2 n = 14	5.857	1.167		

Figure 6

Estimate of Ability

(Comparison of adult-pupil ascending group 3 and adult-pupil descending group 3)

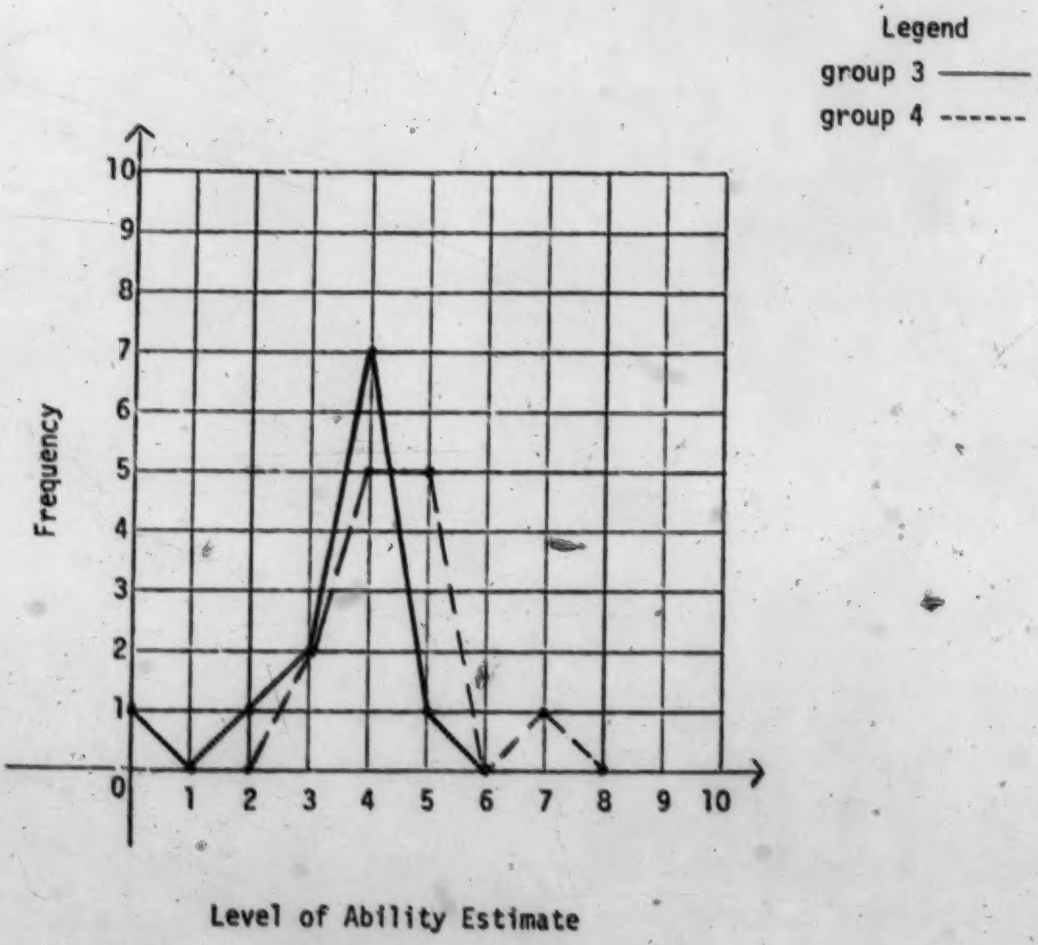


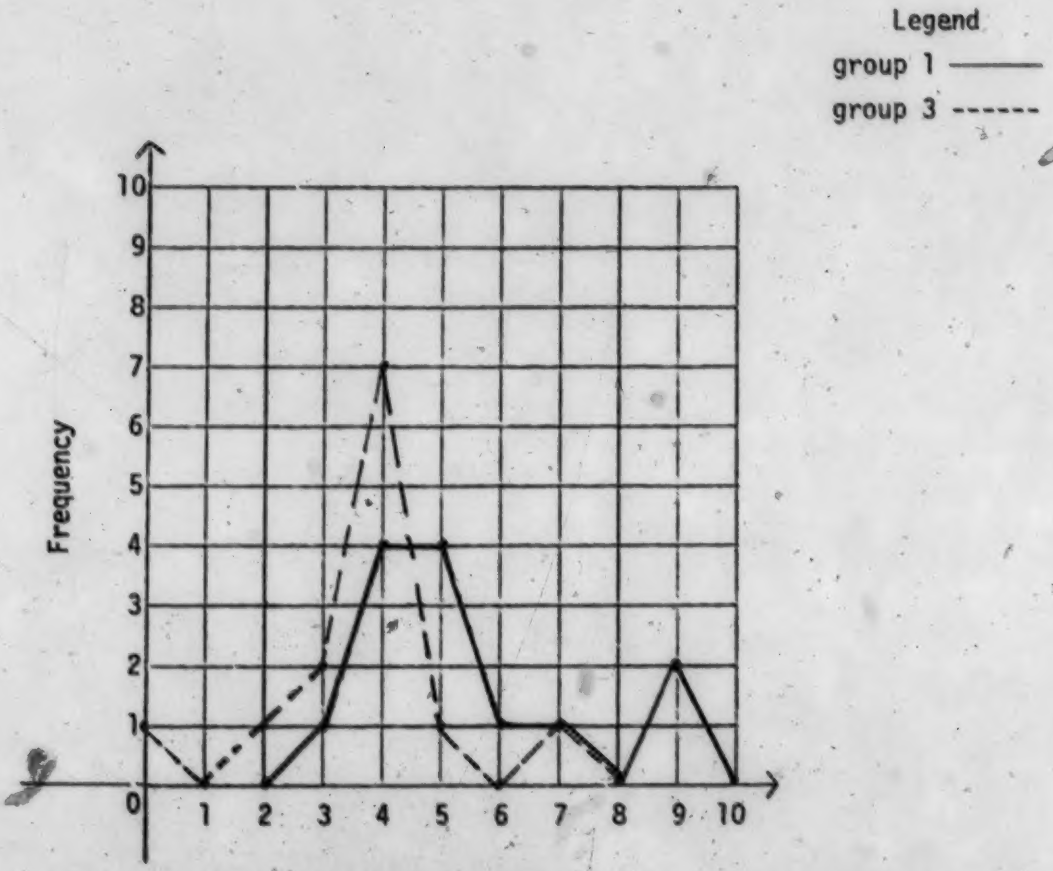
Table 6

	mean	S.D.	(Scheffé) F obs	F critical
group 3 n = 12	3.417	1.311	3.5199	6.69
group 4 n = 13	4.462	1.050		

Figure 7

Estimate of Ability

(Comparison of child-pupil ascending group 1 and adult-pupil ascending group 3)



Level of Ability Estimate

Table 7

	mean	S.D.	(Scheffé) F obs	F critical
group 1 n = 13	5.385	1.894	12.4837	6.69
group 3 n = 12	3.417	1.311		

Figure 8

Estimate of Ability

(Comparison of child-pupil descending group 2 and adult-pupil descending group 4)

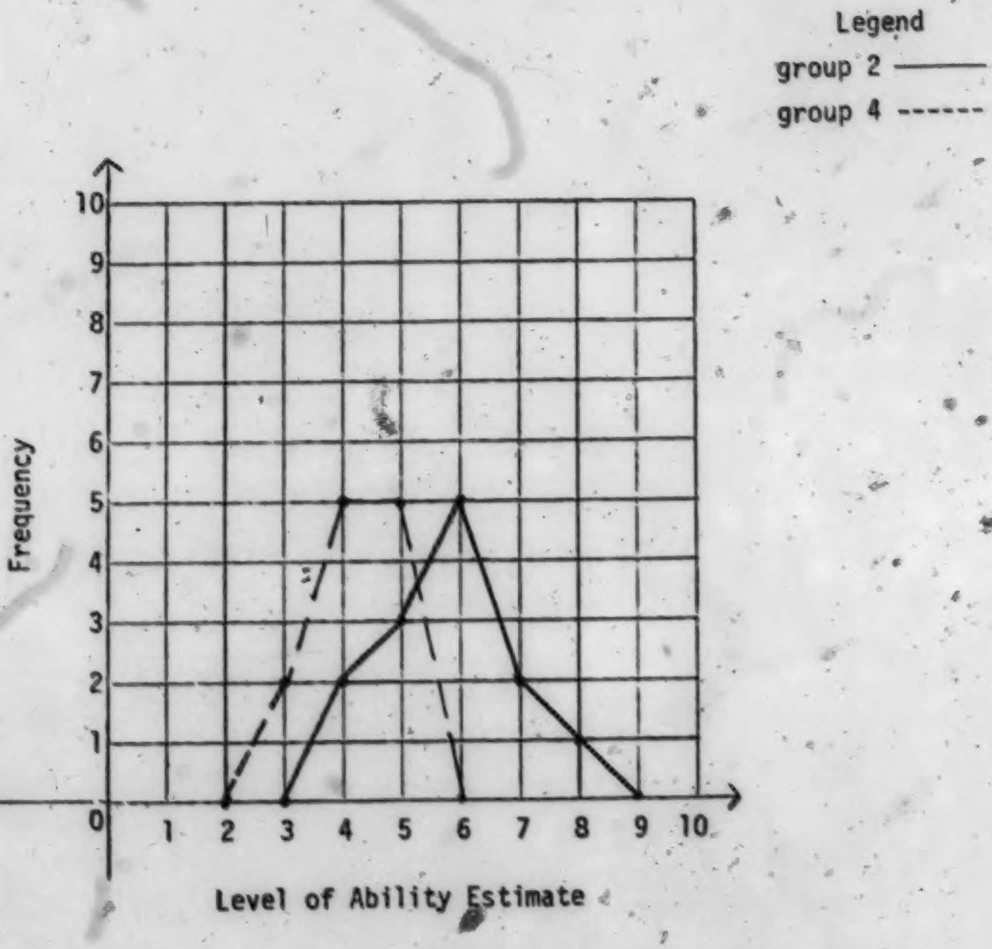


Table 8

	mean	S.D.	(Scheffé) F obs	F critical
group 2 n = 12	5.857	1.167	6.77585	6.69
group 4 n = 13	4.462	1.050		

correlates negatively. None of the correlations is high. The common variance is less than 5% in all cases. It appears that each of the measures is tapping a different variable and no one alone can be considered the sole measure of attribution of ability.

	Prediction	Recall	Estimate
Prediction	1.0	.205	-.281[a]
Recall		1.0	.288[a]
Estimate			1.0

[a] Correlation significant at .05 level.

Discussion of the Results

Primacy Effects

In all instances, the data support the notion that the subjects' final attributions are influenced by their initial impressions. Under some conditions the influence is very strong.

The recall scores indicate a strong primacy effect regardless of the age of the stimulus person. This finding not only supports the findings of Jones et al. (1968) but adds two additional pieces of information. First, adults who are or intend to be teachers do not behave differently with respect to primacy influences on recall than do adults who are not teachers. Second, the age of the stimulus person does not reduce primacy effects on recall.

When predicting future successes, subjects' prediction scores indicate a primacy effect which is very strong in relation to a child-pupil and one, evident but not strong in relation to an adult-pupil. The strong primacy effect in prediction found by Jones et al.

(1968) occurred when the prediction involved information on 30 tasks whereas this study involved prediction based on viewing only ten tasks.

The quantity of information available to the subjects of this study who viewed the adult-pupil may have been too little (by comparison with the Jones subjects) thus the primacy effect, though evident, was weak. Since the primacy effect was strong when subjects were viewing the child-pupil, it may be that the quantity of information provided to the child-pupil subjects need not be as great as for adult-pupil subjects.

In addition, the subjects of this study were all studying elementary education (i.e. teaching of children under 12 years of age) and thus may focus differently on adult-pupils than on child-pupils.

When estimating ability levels, subjects' estimates indicate a significant overall primacy effect which is stronger for child-pupil conditions than adult-pupil conditions. The strength of the primacy effect here is far less than for the other dependent variables. Again the subjects viewing adults were perhaps less susceptible to a primacy effect than were subjects of the Jones et al. (1968) study. Less information may be the reason.

Overall, a primacy effect in attribution of ability was established. The fact that subjects were teacher trainees did not appear to affect the processes. In fact, whereas elementary education students might be expected to resist a primacy influence because of their knowledge of children, the groups who viewed the child-pupil appeared to have been more strongly influenced.

Age of Pupil Effects

An interesting finding for which there appears to be no precedent in the literature, was that subjects predicted significantly higher ability levels for the child-pupil than for the adult-pupil, regardless of order effects. One plausible explanation is that the subjects of the study were studying elementary education. Thus, when faced with interpreting the behavior of an 18 year old pupil, the reference point was their knowledge of themselves rather than knowledge of pupils of that age. This may have induced subjects to assess their own abilities in relation to the tasks, and compare the adult-pupil's performance (and ability) with their own. Finding the tasks quite simple themselves, they then estimated low ability on the part of the adult-pupil. This sort of comparison-with-self was unlikely to have occurred when subjects were viewing the 5 year old pupil.

Conclusions

1. Attributions of ability are subject to a primacy effect when attributions are made immediately following the presentation of the achievement information.

2. The primacy effect holds regardless of the age of the stimulus person. However, the effect appears stronger when the stimulus person is a child.

4. Recall, prediction and estimates of ability are related but distinct variables each of which provides enough unique information that no one of the three should be considered alone in measuring the attribution of ability.

CHAPTER V

SECONDARY ANALYSIS AND RESULTS

The purpose of the secondary analysis was to search the data for relationships between individual characteristics of subjects and susceptibility to primacy effects in the attribution of ability. In addition to susceptibility to primacy in prediction, recall and estimates of ability, two other criterion measures were considered: estimate of pupil motivation, and degree of confidence in attributions.

Information on subjects was gathered on the following eight variables: age, sex, experience with children, type of education program, year of program, stage of professional development, locus of control, and cognitive complexity.

A correlation matrix comprising all five criterion measures and seven of the eight predictors was obtained. The data on stage of professional development were not included in the correlation matrix for reasons explained later in this chapter. The full correlation matrix appears in Appendix K.

Susceptibility to Primacy

The raw data from the questionnaires were such that evidence of a primacy effect was determined by comparing group differences. Thus for one group, high scores indicated primacy influence while in another group low scores indicated primacy influence. As the groups were too small to conduct within group correlations, a transformation of the raw scores was necessary for each of prediction, recall and estimate of ability. The scores on each of the above measures ranged from 0 to 10 inclusive. Scores of individuals in each of the ascending success conditions were converted to a reverse order scale. Thus, for the prediction of success measure, the subject scored one for each failure predicted rather than one for each success predicted. For example, a score of six predicted successes was transformed to a score of four failures, and so on. The same transformation was applied to the recall scores. The estimate of ability scores were treated as though the 11 point scale had been inverted. Thus a score of ten (very high ability) was converted to a score of 0 (very high ability).

The effect of these transformations was to replace all three scores of the subjects in groups one and three with ten minus their original scores. The transformed scores were used in the correlation calculations and were called susceptibility to primacy scores.

Sample Description: Distributions of Individual Differences

The sample of 52 subjects was made up of 42 females and 9 males. (One individual did not complete the item on sex.) The average age was between 26 and 30 years, with 24 subjects falling within the 21 to 25 year old category. The range of kinds of experience with children was from "none" to "children of your own". Twenty-seven subjects had no more than student teaching experience. Six subjects were enrolled in either a graduate diploma or a graduate degree program. The remainder were in undergraduate programs. Three subjects were in their first year of university programs. The remainder had completed at least one year of teacher education. Tables showing complete distributions are shown in Appendix J.

Results

Correlations

Of the 66 possible correlations (see Appendix K) eight were significant ($p < .05$). Three of the eight were of no importance to this study: experience with age ($r = .760$, $p < .000$), sex with type of program ($r = .567$, $p < .000$), and type of program with year of program ($r = .608$, $p < .000$). None of the first five independent variables correlated significantly with any of the five dependent criterion variables. Thus hypothesis Ho_{12} is accepted.

Susceptibility to primacy in prediction and susceptibility to primacy in ability estimates are significantly and negatively correlated. Susceptibility in recall and ability estimate, however, are significantly and positively related. Since the analysis of variance indicated significant age-of-pupil main effects in estimates of ability, the correlations among the susceptibility scores were recalculated for the adult-pupil and child-pupil groups separately. The correlation matrices within each group are reported here:

Child-Pupil Treatments

N = 27

Susceptibility to Primacy	on Prediction	on Recall	on Ability Estimate
on Prediction	1	.3396	-.2559
on Recall		1	-.0166
on Ability Estimate			1

Adult-Pupil Treatments

N = 25

Susceptibility to Primacy	on Prediction	on Recall	on Ability Estimate
on Prediction	1	-.038	-.33
on Recall		1	.6518
on Ability Estimate			1

The negative relationship is more evident in the adult-pupil condition. None of the correlations in either the full matrix or here on the within treatment matrix is very large (the common variance is less than 40% in all instances).

Cognitive Complexity

The distribution of the cognitive complexity scores appears in Appendix L. The mean and standard deviation are 290.574 and 68.096.

Two hypotheses relating to cognitive complexity were stated in Chapter II:

Ho_9: There is no significant correlation between cognitive complexity and susceptibility to primacy in each of prediction, recall, and estimates of ability.

Ho_{10}: There is no significant correlation between cognitive complexity and degree of confidence.

The correlation between cognitive complexity and susceptibility to primacy in prediction is positive and significant ($r = .307$, $p < .027$). The correlations with susceptibility to primacy on the other two measures were slightly negative and not significant. Thus

Ho_9 is partially supported. Though the correlations with two of the measures were negative, they were not significant. The one measure which reached an acceptable level of significance was positive rather than negative.

The correlation between cognitive complexity and confidence was negative and significant ($r = -.266$, $p < .057$). Thus Ho_{10} is rejected.

One further correlation proved significant: the correlation between estimated level of motivation and cognitive complexity ($r = -.294$, $p < .034$).

Locus of Control

The distribution of locus of control scores, which are indicators of degree of externality, appears in Appendix M. The mean and standard deviation are 9.846 and 3.939.

One hypothesis relating to locus of control was stated in Chapter II:

Ho_{11}: There is no significant correlation between locus of control and estimate of motivation.

No significant relationship was found ($r = -.174$, $p < .218$). Therefore Ho_{11} was accepted.

A significant negative correlation was found between locus of control and age ($r = -.337$, $p < .015$).

Stage of Professional Development

The early work of Kass and Wheeler (1975) has led them to believe that teachers develop through three stages in their concerns about teaching. In the first stage, the concerns expressed by teachers are related to their self-concepts as teachers and their competence in classroom management. The second stage is characterized by concerns about curriculum content. In the third stage major concerns are expressed about the match of curriculum to the individual pupil. Kass and Wheeler have conducted three preliminary studies which resulted in the construction of the questionnaire which was used in this study. The pattern of responses on the questions reveals the stage of development of the teacher, based on the concerns he expresses.

Though the modifications to the questionnaire which were made for use in this study appear minor, they seem to have had a major effect on the results. Subjects' responses to the questionnaire did not permit categorization of subjects into one of the three stages of development. Though several scoring procedures were tried, no clear statistics resulted which could be used in a correlational analysis. Subjects either marked all statements as "a major concern now" or their responses were so very scattered through the categories that no clear pattern emerged.

Discussion

Susceptibility to Primacy

The data indicate that the higher the susceptibility to primacy in prediction of success, the lower the susceptibility to primacy in estimating ability. Nothing in the data provides any information as to the reason for this unusual relationship. One possible explanation may be related to the order of the questions in the questionnaire. Prediction was required first, then recall, and finally an estimate of ability. Perhaps the prediction, being closest in time to the actual treatment, was most heavily influenced by the order of presentation of information. The intervening recall question then may have led to a reassessment which affected the susceptibility to primacy in estimating ability.

A second possibility is related to Luchins' research, cited earlier, which suggests that a time interval between the observation and the impression formation can dilute the primacy effect. The prediction and recall tasks may have produced a time lag which served to reduce the primacy effect on estimate of ability.

The strong negative correlation suggests that perhaps both variables, time lag and recall triggering effect, may be operating. The higher the prediction score the greater the triggering effect of the recall score when a time lag exists between the observation and the estimate of ability. Further research would be necessary in order to identify the processes involved.

Cognitive Complexity

The results of the analyses provide reason to believe that the role of cognitive complexity is not so much one of affecting the actual attributions, but rather one of affecting the degree of confidence with which the attributions were made. The more cognitively complex the individual, the less likely he is to make a confident or firm attribution of ability based on a short sequence of behavior.

The relationship of cognitive complexity to the actual susceptibility scores is not clear. The order of presentation of the criterion questions may have had an influence. A strong positive correlation existed with the first measure, prediction, and a negative (but non-significant) correlation with recall, the second measure. The correlation with ability estimate is negative but smaller than with recall. This suggests that a cognitively complex person may be initially susceptible, but the recall question may induce him to re-evaluate his impression and modify his ability estimate on the basis of that re-evaluation.

Locus of Control

To the extent that belief about locus of control is a univalent personality trait, it appears to be related to age ($r = -.337$, $p < .015$). The older the individual, the less he believes events to be externally controlled. There is no indication that this belief about oneself is generalized to beliefs about locus of control in lives of other people.

Conclusions

1. Susceptibility to primacy does not appear to be consistent across prediction, recall, and estimate of ability. There appears to be an inverse relationship between susceptibility in prediction and recall on one hand, and susceptibility in ability estimates on the other. One possible influencing factor may be the order of testing and resultant time lag.

2. Cognitive complexity appears to be related to the confidence with which subjects make their attributions of ability. The higher the complexity level the lower the confidence level. This finding is consistent with the theoretical descriptions of the

underlying construct.

3. Cognitive complexity may be differentially affecting each of susceptibility to primacy measures. Whereas the more complex individual appears more susceptible in prediction than the less complex individual, he appears less susceptible in his recall and ability estimates. The time and impetus to reflect provided by the prediction recall and ability estimate tasks may be affecting the more complex individual differently than the less complex subject.

4. Generalized belief about locus of control does not appear to be related to the estimate of motivation.

CHAPTER VI

CONCLUSIONS, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The purpose of this study was to examine the effects of order of pupil achievement information on teachers' attributions of pupil ability. The reason for conducting such a study was two-fold. Because teachers' expectations may affect children's behavior, knowing more about how erroneous expectations develop may lead to elimination of possible harmful effects on children of such expectations. As well, the research being conducted on attribution may have broad application to education of children if it can be established that the propositions which hold true in research with adults also hold true when the research is conducted with teachers and children.

Conclusions of the Study

The following conclusions are based on the data and analyses contained in Chapters IV and V:

1. A strong primacy effect in the attribution of ability was indicated. This effect was stronger for prediction and recall than for estimates of ability, and was stronger for child-pupil groups than for adult-pupil groups. Erroneous recall and biases in predictions and ability estimates would not be expected of teachers because of their supposed concern for accurate diagnosis, their knowledge of child development and learning, and their experiences

with the variability of pupil behavior. However, the subjects of this study showed not only primacy effect biases, but the effects were stronger for the child-pupil condition, the very age of pupil which the subjects have been studying.

2. The three main dependent variables in the study were prediction of success, recall of observed successes, and estimate of ability. The correlations between the variables was low, indicating that each measure may be tapping essentially different information relating to the attribution process. The negative relationship between predictions and ability estimates may indicate that the order of testing and the time lag between observation and estimate of ability were affecting the results. Further research would be necessary to substantiate this hypothesis.

3. The cognitive complexity of the individual subject is related to the degree of confidence he expresses about his attribution. The higher the complexity level, the lower the confidence level.

4. Locus of control bears no significant relationship to the estimate of motivation when, in a study such as this, the complete four component model (Weiner et al., 1971) is not used.

Implications for Education

The influence of the primacy effect on a teacher's impressions of children can impair the teacher's effectiveness. Though this premise has yet to be thoroughly explored through research, one can conceive of a variety of ways in which erroneous judgements might affect the teaching-learning process. As teachers become more involved in curriculum development, their diagnostic skills will become increasingly important in overall planning. To match the curriculum to the needs of the child requires accurate assessment of these needs. Erroneous judgements in assessment can result in a poor match of program to child. The child's learning may be impaired.

A child's self-concept grows as he sees himself reflected in the behavior of significant others toward him. If a teacher's impressions of a child are biased, his behavior toward the child may cause the child to develop the same biases toward himself. He may not only develop an inaccurate self-concept, but one which is negative as well.

The child who consistently creates the impression of being a "slow starter" may never be able to shake this impression. Not only might he live under the stigma of "slow starter" with one teacher, but with all teachers as records and informal information are passed from one teacher to the next.

It would appear that erroneous impressions of any kind could be detrimental to the child, but primacy effect errors may be much more vile than other kinds. Primacy effect errors could result in a teacher never recognizing the learning which is taking place (or perhaps not taking place). Recency errors, on the other hand, may not negate learning which is taking place if the child is increasingly successful. However a productive balance would seem to be a situation in which impressions are accurate but multivariate and flexible, capable of addition and modification as new information is acquired and meshed with all previous information. This would appear to require a relatively high degree of cognitive complexity in the individual teacher. If tentative recommendations for action were to be made on the basis of this dissertation, they would be the following:

1. Teachers need to be made explicitly aware (both in preservice and inservice preparation) of the primacy effect and how it operates in the attribution of ability. They must be alerted to the possible dangers of allowing first impressions to distort attributions.

2. If it can be assumed that Luchins' work holds true for teachers and children, continuous teacher anecdotal record keeping on individual children (with an emphasis on factual information being continually added) may serve to dilute the primacy effect.

3. If the element of cognitive complexity, which induced the subjects to hesitate in making strong attributions, was a greater degree of differentiation, then deliberate attempts must be made to help teachers become increasingly multidimensional in forming their impressions of individual children.

Directions for Further Research

The results of the study would seem to indicate three fronts on which further research needs to be conducted.

Attribution of Ability and Teaching Functions

Since this study was related to only one teaching function, namely assessment through observation, further studies need to be conducted in connection with other teaching functions. The primacy effect may extend beyond impression formation to planning of curricula following diagnosis, to interaction with children, to affection for the children, and to evaluating the work of children. The active involvement in teaching may affect the teacher's attributions differently than does the observation of teaching. Studies similar to this one could be conducted which add further teaching functions to the design.

Eroding the Primacy Bias

Replication of Luchins' work as it relates to teachers and children would be most useful. Knowledge of how teachers might learn to avoid the primacy effect would have implications for teacher preparation. A better understanding of the relationship of cognitive complexity to attribution would have implications not only for teacher education but perhaps for screening and selection as well.

Attribution Theory and Teaching

This study dealt with one way in which attribution of ability can be influenced. Many other aspects of attribution theory deserve attention. Perception of role behavior may affect attribution of ability. Order of information may affect the attribution of attitude. The relationship of attribution of ability and attribution of attitude is virtually unknown. All of these relationships and many others may be relevant to education.

A program of further experimental and field research is needed to provide the information necessary to answer the many questions about the relationship between attribution and education.

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APPENDIX A

TWO POOLS OF THIRTY PROBLEMS

APPENDIX A

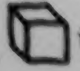
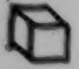
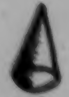
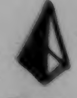
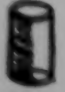
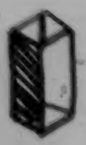
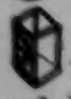
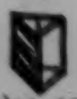
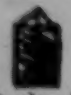
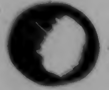
POOL OF TASKS

Tasks for Adult Pupil

The following problems were constructed from the information available on Miller Analogies Tests (Psychological Corporation, 1970). The number to the left of each task is an identification number only.

Task Number	Task	Solution
1	Light is to dark as pleasure is to __________. picnic day pain night	pain
2	Chair is to table as ship is to __________. dock water mast boat	dock
3	☆ is to □ as □ is to __________. ▭ ✡ △ ◇	△
4	3 is to 9 as 4 is to __________. 16 14 6 13	16
5	Depart is to leave as remain is to __________. stay go home come	stay
6	I is to X as V is to __________. L C M D	L

Tasks for Adult Pupil (Continued)

Task Number	Task				Solution
7	2^2 is to 2^3 as 1 is to ___________.				2
	2	4	6	8	
8	Elbow is to wrist as knee is to ___________.				ankle
	foot	arm	leg	ankle	
9	 is to □ as □ is to ___________.				———
		△	▭	———	
10	Willow is to tree as iron is to ___________.				element
	compound	element	steel	rust	
11	Nail is to wood as staple is to ________.				paper
	clamp	paper	glue	food	
12	Jupiter is to earth as the sun is to ________.				north star
	mars	north star	pluto	neptune	
13	 is to  as  is to ________.				
					
14	Loaf is to slice as plank is to ___________.				saw
	saw	hammer	pirate	board	
15	Yard is to step as second is to ___________.				moment
	tread	motion	minute	moment	

Tasks for Adult Pupil (Continued)

Task Number	Task	Solution
16	Window is to pane as wall is to ________. frame door sash panel	panel
17	0 is to 1 as 7-7 is to ________. 7^0 $7+1$ $7\div1$ $\frac{7}{7}$	$\frac{7}{7}$
18	File is to letter as shelf is to ________. office book stockroom draw	book
19	Finite is to infinite as $\frac{1}{2}$ is to ________. $\frac{1}{0}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{1}{10}$	$\frac{1}{0}$
20	Alberta is to county as Edmonton is to ________. township city state parish	parish
21	Find is to seek as hear is to ________. locate retrieve look listen	listen
22	Restaurant is to menu as college is to ________. warehouse inventory stock calendar	calendar
23	Body is to physiology as triangle is to ________. astronomy algebra calculus geometry	geometry
24	Beach is to sand as ocean is to ________. waves water blue shiny	water

Tasks for Adult Pupil (Continued)

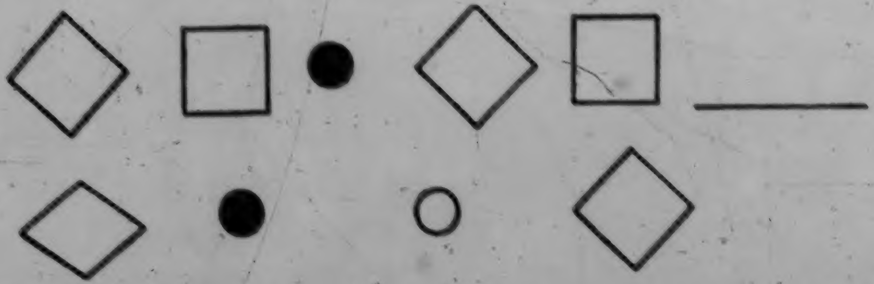
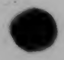
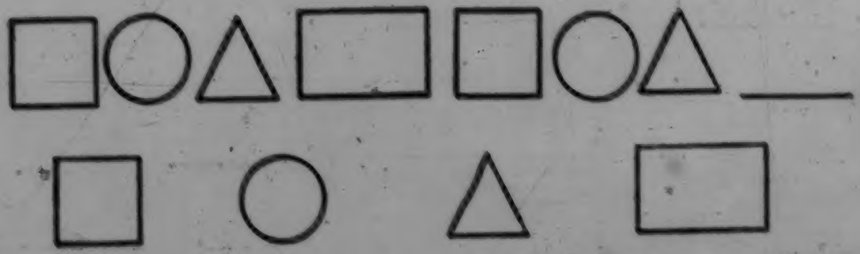
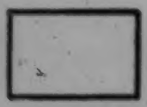
Task Number	Task	Solution
25	Square is to cube as circle is to __________. pyramid sphere triangle tetrahedron	sphere
26	A room is 10 feet by 10 feet by 10 feet. Then the floor area is to 100 as the total volume is to __________. 100 10 1000 cubed	1000
27	Hog is to job as leap is to __________. jump fast run totter	run
28	Beethoven is to music as Picasso is to __________. drama opera painting fiction	painting
29	Pound is to hammer as cut is to __________. wise nail chisel mallet	chisel
30	24 is to 12 as 12 is to ______. 4 5 6 7	6

APPENDIX A

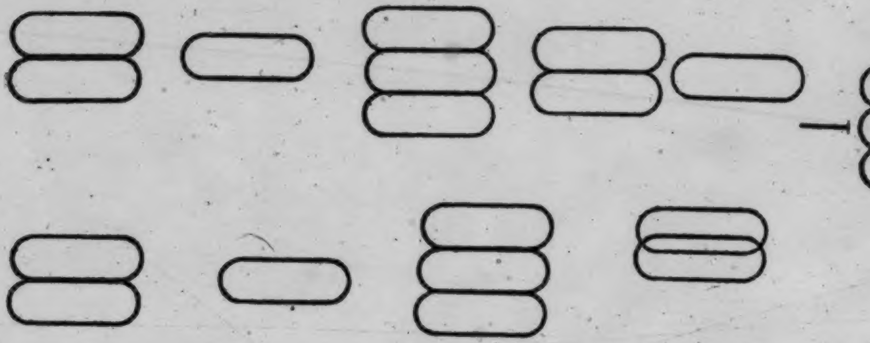
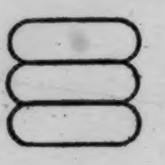
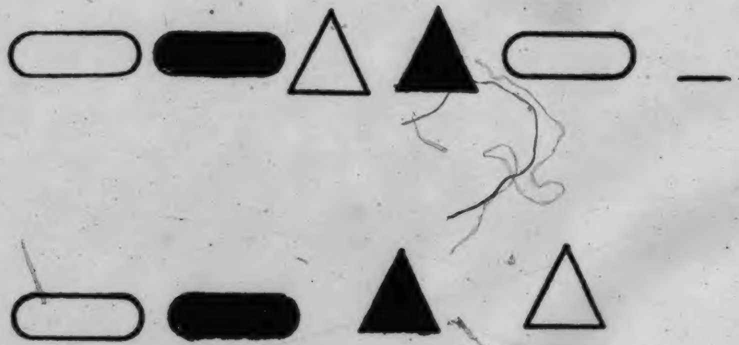
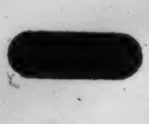
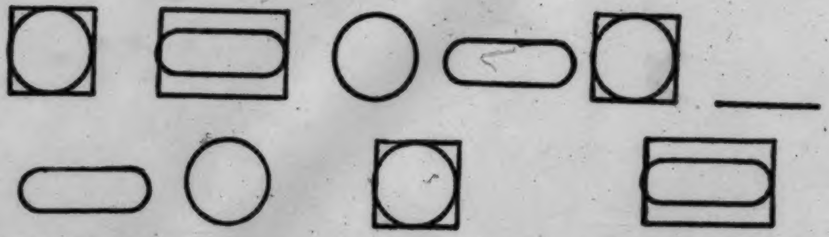
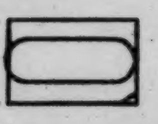
POOL OF TASKS

Tasks for Child Pupil

The following problems were constructed from the information available in Pattern processing and elementary school mathematics (Blackhall, 1974). The number to the left of each task is an identification number only.

Task Number	Task	Solution
1		
2		

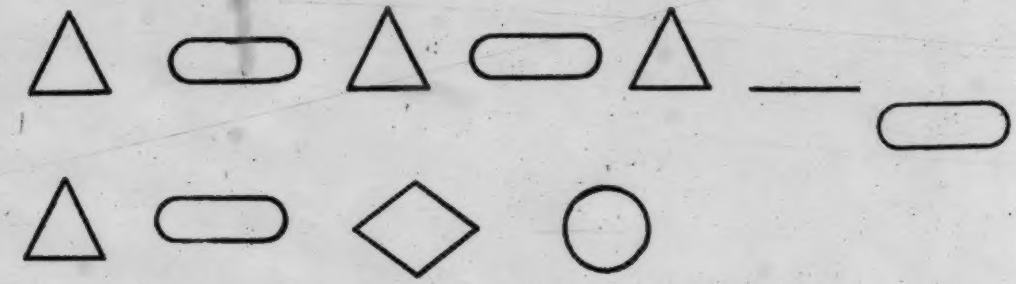
Tasks for Child Pupil (Continued)

Task Number	Task	Solution
3		
4		
5		

Tasks for Child Pupil (Continued)

Task Number | Task | Solution

6



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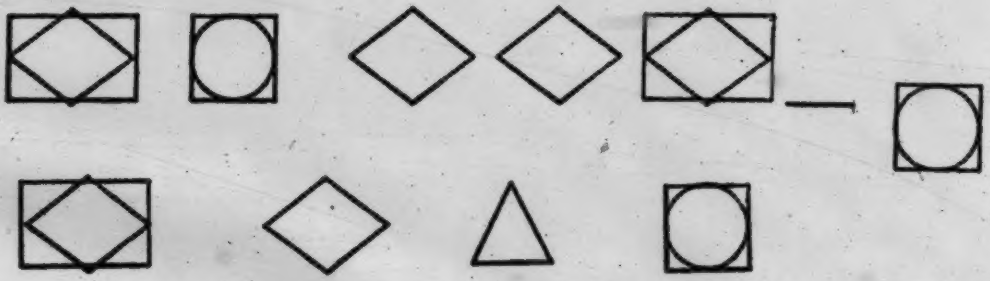

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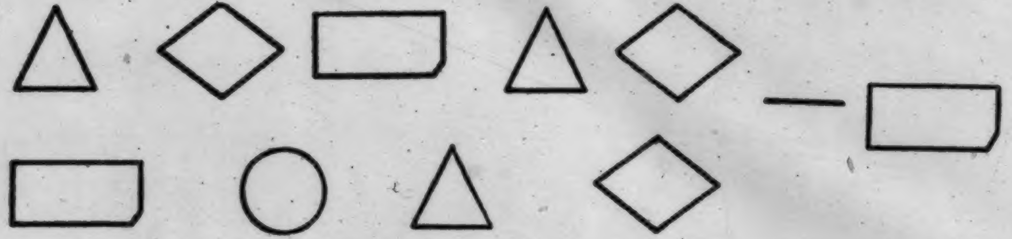

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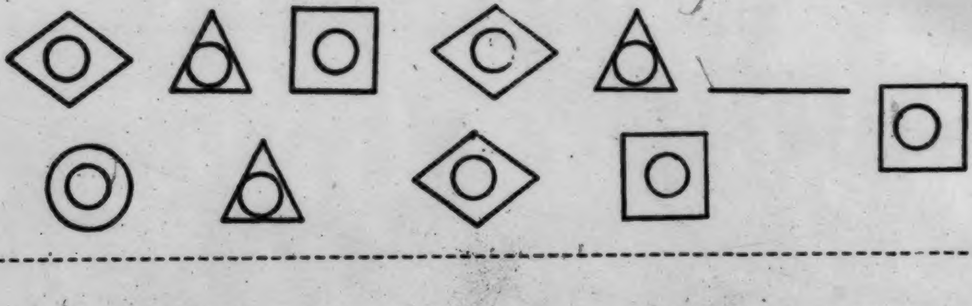
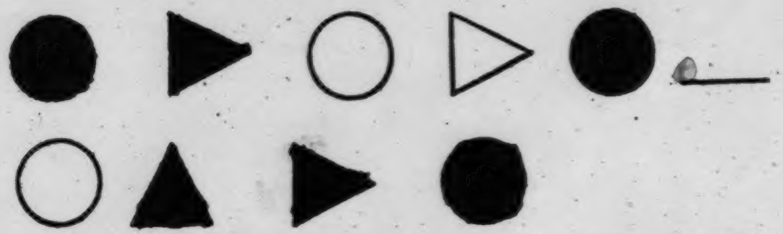
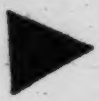
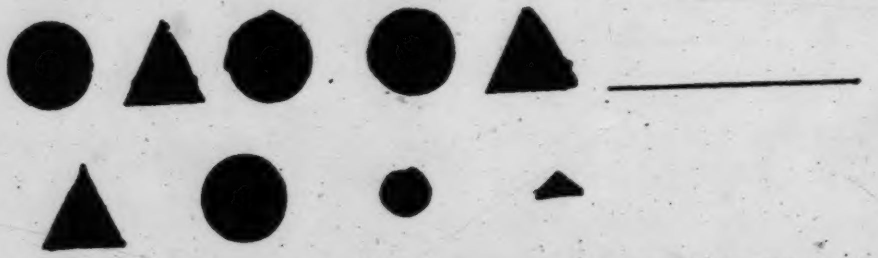
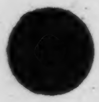
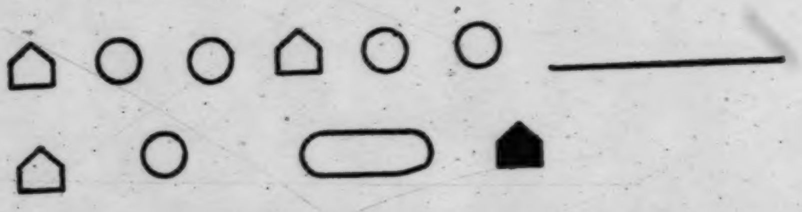
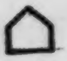
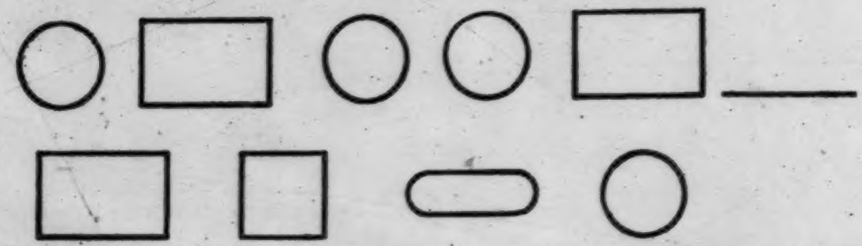
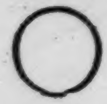


Tasks for Child Pupil (Continued)

Task Number	Task	Solution
10		
11		
12		
13		

Tasks for Child Pupil (Continued)

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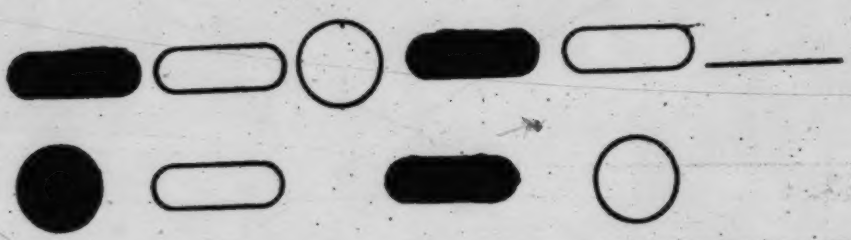
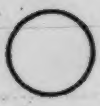
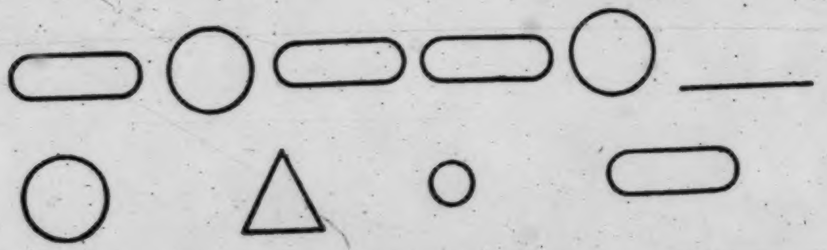
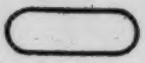
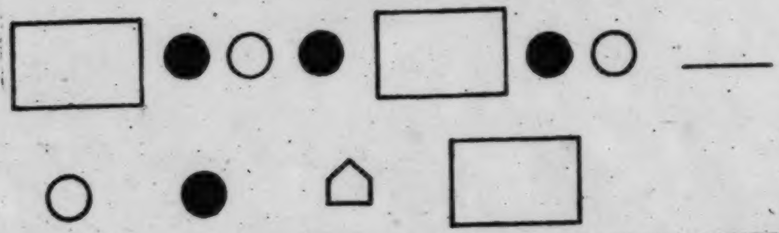
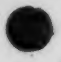
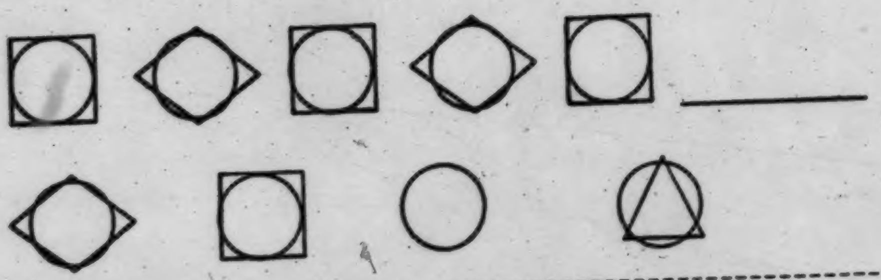
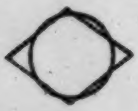
14		
15		
16		
17		

Tasks for Child Pupil (Continued)

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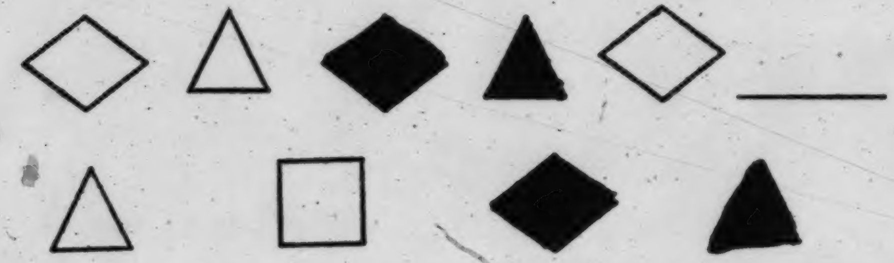
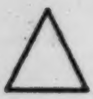
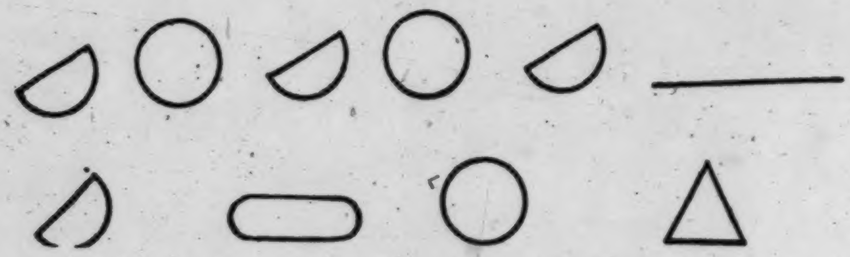
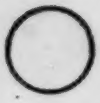
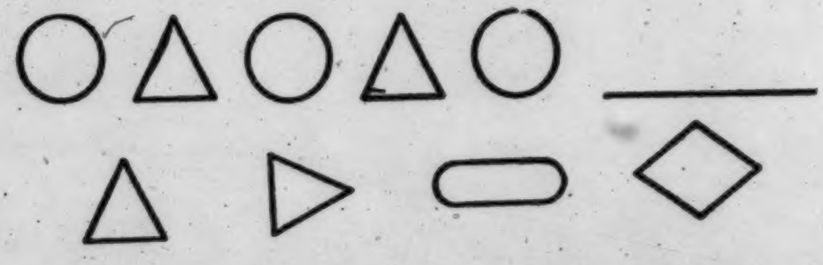
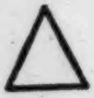
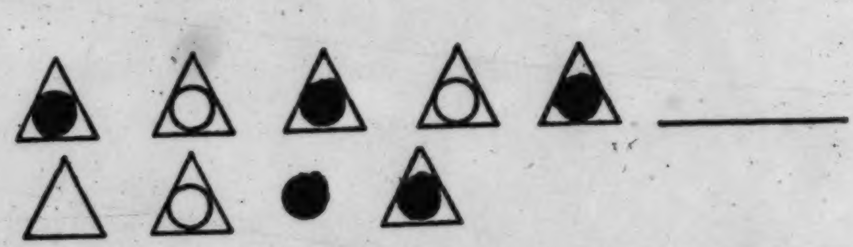
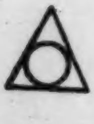
18		
19		
20		
21		

Tasks for Child Pupil (Continued)

Task Number	Task	Solution
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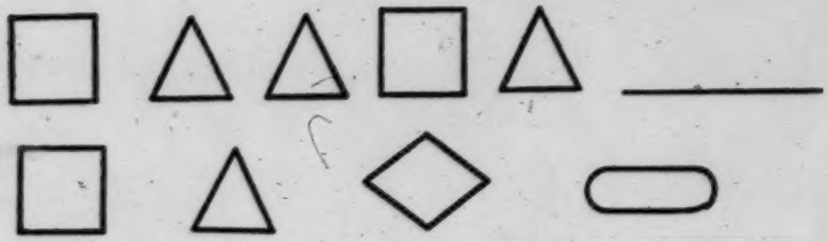
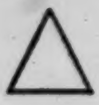
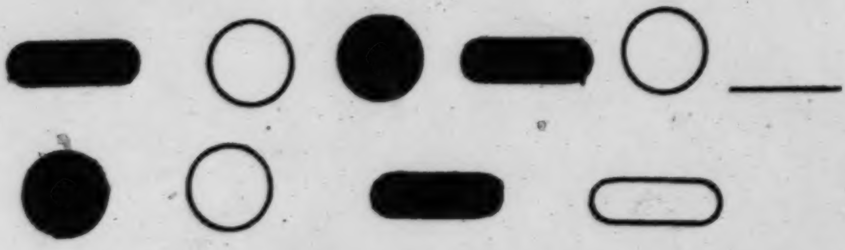
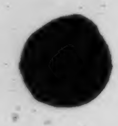
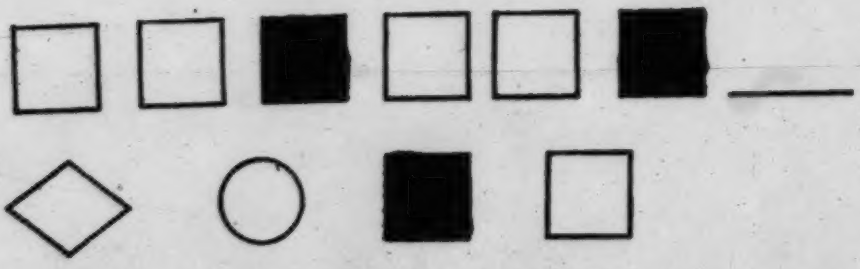
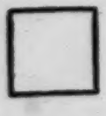
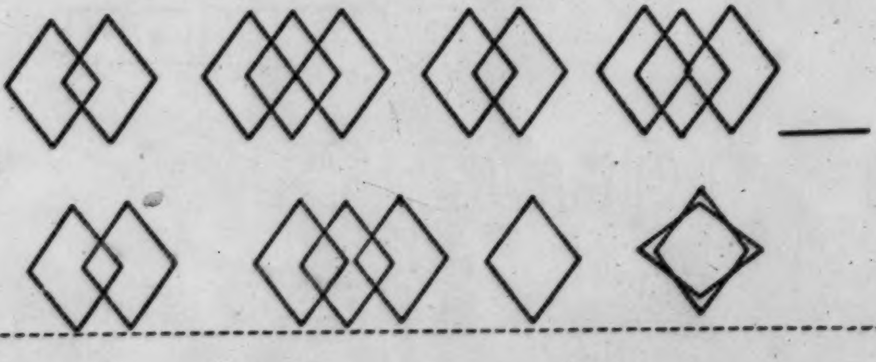
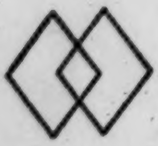
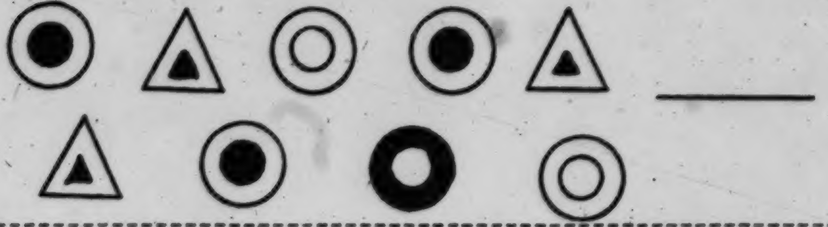
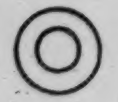
23	● ■ ● ○ □ ____ ○ △ ◆ ●	○
24	△ ■ △ ■ △ ____ △ ▲ □ ■	■
25	▭ ▬ ● ▭ ▬ ____ ▭ ○ ● ▬	●

Tasks for Child Pupil (Continued)

Task Number	Task	Solution
26		
27		
28		
29		

Tasks for Child Pupil (Continued)

Task Number	Task	Solution
30		

APPENDIX B

TABLE OF TASK DIFFICULTY JUDGEMENTS

Frequency Table of Task Difficulty Opinions

x = difficult   o = easy

ADULT TASKS			CHILD TASKS		
Task Number	Judges' Estimates		Task Number	Judges' Estimates	
1	o o	o o o o	1	o o	o
2	x		2		
3	x x	x x	3	x x	x o
4	o		4	x	
5	o o	o o x	5	x x	x x o
6	x x		6	o o	o o o o
7	x x	x	7	x x	x x x x
8	o o	o	8		
9	o		9		
10	x		10	x	
11	o o	o	11		
12	x x	x x	12	o	
13			13	x o	
14	x		14		
15	x x	x	15	x	
16	x		16	o	
17	x x	x	17	x	
18	o		18		
19	x x		19	o o	o o
20	x o		20	o o	o o o o
21			21	o	
22	o		22		
23			23	x x	
24	o		24	o o	o o o
25			25		
26			26	x x	
27			27	x x	
28	o o	o	28		
29			29	x x	x
30	o		30	x x	x

APPENDIX C

SELECTION AND ORDER OF PRESENTATION OF TASKS

SELECTION AND ORDER OF PRESENTATION OF TASKS

From each pool of 30 problems, ten problems were deleted as being too hard or easy (see description of procedure in Chapter III) leaving 20 problems in each pool. The problems were then randomly assigned to treatment or criterion measure. The order of selection became the order of presentation.

Adult Pupil Tasks

Order of Presentation	1	2	3	4	5	6	7	8	9	10
Treatment Tasks	#22	#30	#13	#29	#18	#23	#10	#4	#6	#25
Criterion Tasks	#21	#2	#16	#14	#20	#24	#19	#9	#27	#26

Tasks #1 and #5 were used as sample problems.

Child Pupil Tasks

Order of Presentation	1	2	3	4	5	6	7	8	9	10
Treatment Tasks	#17	#23	#28	#18	#16	#25	#13	#8	#11	#15
Criterion Tasks	#2	#10	#4	#9	#26	#14	#12	#22	#27	#21

Tasks #6 and #20 were used as sample problems.

APPENDIX D

VIDEO-TAPE SCRIPTS

VIDEO-TAPE SCRIPTS

Video-Tapes I and II: Child Pupil

	Visual Content	Verbal Content
1	Title Card: A Study of Observing Pupil Behavior	Welcome to study group number (one or two) and thank you for agreeing to be a part of this study. You are involved in a study of observing pupil behavior.
2	(Credits) Card #1: by: Susan Therrien assisted by: Mary Mallet Michael MacKay Andrew MacKay and Spencer Card #2 narrated by: Jean MacIntyre	Following the presentation of this video-tape you will be given an envelope containing a questionnaire and pencil. Until that time the desk in front of you should be clear. Again, welcome to the study. I hope you enjoy the video-tape and later discussions.
3	Spencer and Mary enter the area and go to the table and sit	During your teacher education and later as a classroom teacher you have been or will be involved in observing your pupils engage in testing situations. Throughout this tape you will be seeing

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content
	Spencer involved in a testing situation. Spencer is 5 years old and will be entering first grade in the fall. He is one among many children in the kindergarten who were being tested before grade one entrance. Mrs. Mallet, who is conducting the testing, will be presenting a series of problems to Spencer. She will explain the problems then collect and record the answers.
4 First sample problem Mary reaches for card	The first two problems presented to Spencer are sample problems only and are not part of the test.
5 Mary covers the solutions	In presenting the problem, Mrs. Mallet covers the answers on the card until Spencer is ready to choose his answer.
6 The problem is presented on lower screen	Because the video-camera is too far away for you to get a clear view of the problem card, each problem will be presented at the bottom of your screen.

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content
7 Mary and Spencer discuss the problem	This is not a timed test. Though Mrs. Mallet engages in conversation with Spencer, she does not tell him if he has chosen the correct solution. She simply asks him to tell her what he sees and why he chose a particular solution.
8 Mary points to the shapes	Mrs. Mallet helps Spencer to focus on the problem by having him name the shapes he sees.
9 The problem card disappears and Spencer circles his solution	Once Spencer has chosen his solution, he chooses a coloured pen and circles it. Each card is covered with clear plastic so that it may be reused in testing other children.
10 Second sample problem: Mary reaches for the card and covers the solutions	Mrs. Mallet presents the second sample problem and again covers the solution to help Spencer focus on the problem itself.
11 The problem is presented on the lower part of the screen	As you can see, each problem is made up of a series of shapes. Mrs. Mallet explains that the row of shapes make a pattern. She

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content
	helps Spencer to see the pattern by moving her finger from left to right as he names the shapes.
12 Mary removes the card covering the solutions.	She then removes the card covering the possible solutions and explains to Spencer that he is to circle the shape which should come next in the pattern. After Spencer has circled his solution, the card is set aside before the next card is presented.
13 First test problem: Mary reaches for problem and covers the solution	Once she is certain that Spencer understands what he is to do, Mrs. Mallet presents the first test problem.
14 The problem is presented on the lower screen	Again she has Spencer focus on the shapes from left to right and helps him to verbalize what he sees. She has him name the shapes one at a time.
15 Spencer points and smiles	Then she asks him to make his choice.

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content	
16 Spencer is choosing	Because it is difficult to see Spencer's solutions, a second camera is recording whether or not he is successful in solving the problem.	
17 The problem drops off the bottom of the screen	After each problem you will be told whether or not Spencer did the problem successfully.	
18 Card showing either "successful" or "unsuccessful"	Tape I On problem #1 Spencer's answer was incorrect. He was not successful in solving the problem.	Tape II On problem #1 Spencer's answer was correct. He was successful in solving the problem.
19 Mary reaches for and presents second problem	Spencer is allowed to work through each task at his own speed. For each problem there are four possible solutions from which Spencer must choose his answer. Though the shapes differ from problem to problem, the task which Spencer performs is the same. That is, in each case he must figure out the pattern and circle the	

Video-Tapes I and II: Child Pupil (Continued)

<table>
<tr><th>Visual Content</th><th colspan="2">Verbal Content</th></tr>
<tr><td></td><td colspan="2">shape which would come next in the pattern.</td></tr>
<tr><td>20 Card showing either "successful" or "unsuccessful"</td><td>Tape I
On test problem #2 Spencer's solution was incorrect. He was not successful in solving the problem.</td><td>Tape II
On test problem #2 Spencer's solution was correct. He was successful in solving the problem.</td></tr>
<tr><td>21 Spencer looks up at cameras, then focuses on problem</td><td colspan="2">Spencer's attention was only occasionally drawn to the cameras. Mrs. Mallet draws his attention to problem #3 and asks him to name the shapes.</td></tr>
<tr><td>22 Card showing either "successful" or "not successful"</td><td>Tape I
Spencer was unable to solve problem three correctly. His solution was not successful.</td><td>Tape II
Spencer was able to solve problem three correctly. His solution was successful.</td></tr>
<tr><td>23 Task #4: Spencer chooses a new coloured pen</td><td colspan="2">Spencer chooses a different pen for task #4. The felt pens were provided in eight different colours to make the tasks more interesting to Spencer. He removes the card</td></tr>
</table>

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content	
	covering the answers and procedes to circle his solution.	
24 Card showing either "successful" or "not successful"	Tape I On task #4 Spencer's solution was correct. He was successful in solving the problem.	Tape II On task #4 Spencer's solution was incorrect. He was not successful in solving the problem.
25 Task #5 presented	Mrs. Mallet presents task number 5 which involves a pattern of rectangles and small circles. Spencer must choose from the four shapes presented on the bottom row.	
26 Card showing either "successful" or "not successful"	Tape I Spencer was unable to solve this problem correctly. His solution was not successful.	Tape II Spencer was able to solve this problem correctly. His solution was successful.
27 Task #6: Mary and Spencer engage in a brief discussion about the pens	Mrs. Mallet talks with Spencer briefly about the pens he is using and then goes on to present problem #6.	

Video-Tapes I and II: Child Pupil (Continued)

<table>
<tr><th>Visual Content</th><th colspan="2">Verbal Content</th></tr>
<tr><td>28 Task #6 is presented</td><td colspan="2">The problem appears on your screen as dark and light shapes. They are actually black and white on the cards being presented to Spencer. The pattern problems he is solving do not involve colours other than black and white.</td></tr>
<tr><td>29 Card showing either "successful" or "not successful"</td><td>Tape I
On task #6 Spencer's solution was correct. He solved the problem successfully.</td><td>Tape II
On task #6 Spencer's solution was incorrect. He did not solve the problem successfully.</td></tr>
<tr><td>30 Task #7: Mary presents problem</td><td colspan="2">Spencer begins problem seven by once again examining the row of shapes.</td></tr>
<tr><td>31 Spencer chooses solution</td><td colspan="2">After naming the shapes from left to right he examines the solutions in the second row and circles his answer.</td></tr>
<tr><td>32 Card showing either "successful" or "not successful"</td><td>Tape I
On problem #7 Spencer's answer was incorrect. He was not successful in solving the problem.</td><td>Tape II
On problem #7 Spencer's answer was correct. He was successful in solving the problem.</td></tr>
</table>

Video-Tapes I and II: Child Pupil (Continued)

	Visual Content	Verbal Content	
33	Task #8: Spencer points to the equipment	As Spencer begins problem eight he asks about the camera equipment. Before helping him begin the problem she explains that the cameras are making a movie of him and that he will be able to see the pictures when he has finished the problems.	
34	Spencer chooses his answer.	Spencer chooses his answer.	
35	Card showing either "successful" or "not successful"	Tape I Spencer's solution to problem 8 was correct. He was successful in solving the problem.	Tape II Spencer's solution to problem 8 was incorrect. He was not successful in solving the problem.
36	Task #9 is presented	Spencer will be tested in several different ways. However, you are seeing only that portion of the testing which involves pattern problem solving.	
37	Card showing either "successful" or "not successful"	Tape I On problem #9 Spencer was successful in solving the	Tape II On problem #9 Spencer was not successful in solving the problem.

Video-Tapes I and II: Child Pupil (Continued)

<table>
<tr><th rowspan="2">Visual Content</th><th colspan="2">Verbal Content</th></tr>
<tr><th>Tape I</th><th>Tape II</th></tr>
<tr><td></td><td>problem. His answer was correct.</td><td>His answer was incorrect.</td></tr>
<tr><td>38 Task #10 is presented</td><td colspan="2">With his pen already selected, Spencer begins task #10.
He removes the card blocking the answers and circles his choice.</td></tr>
<tr><td></td><td>Tape I</td><td>Tape II</td></tr>
<tr><td>39 Card showing either "successful" or "not successful"</td><td>On problem #10 Spencer's answer was correct. He was successful in solving the problem.</td><td>On problem #10 Spencer's answer was incorrect. He was not successful in solving the problem.</td></tr>
<tr><td>40 Mary collects up the pile of problem cards</td><td colspan="2">Task #10 was the final problem in this part of the testing.</td></tr>
<tr><td>41 Mary chats with Spencer</td><td colspan="2">Following a chat with Mrs. Mallet about the coloured pen markings on his hands, Spencer will have a break before continuing on to the next portion of the test.</td></tr>
</table>

Video-Tapes I and II: Child Pupil (Continued)

Visual Content	Verbal Content
42 Blank screen	You will now be presented with a questionnaire about the video-tape you have just seen.
	End of Tape

Video-Tapes III and IV: Adult Pupil

Visual Content	Verbal Content
1 Title Card: A Study of Observing Pupil Behavior	Welcome to study group number (three or four) and thank you for agreeing to be a part of this study. You are involved in a study of observing pupil behavior.
2 (Credits) Card #1: by: Susan Therrien assisted by: Mary Mallet Michael MacKay Andrew MacKay and Spencer	Following the presentation of this video-tape you will be given an envelope containing a questionnaire and pencil. Until that time the desk in front of you should be clear. Again, welcome to the study. I hope you enjoy the video-tape and later discussions.
3 Michael and Mary enter and go to table and sit	During your teacher education and later as a classroom teacher you have been or will be involved in observing your pupils engage in testing situations.

Video-Tapes III and IV: Adult Pupil (Continued)

Visual Content	Verbal Content
	On this tape you will view Michael being tested. Michael is 18 years old and is one of several pupils who in their final year of high school are being tested for vocational guidance counselling.
4 First sample problem is presented	Mrs. Mallet first presents two sample problems to Michael and asks him to read them aloud. Because the video-camera is too far away for you to get a clear view of the problem card, each problem will be presented at the bottom of your screen. In each of the problems Michael must choose his solutions from the four possible solutions on each problem card.
5 Mary sets cards before Michael	Once Mrs. Mallet is certain that Michael understands what is expected of him, she sets the task cards before him and instructs him to write his answers on the answer sheet provided. Michael works through the problems at his own speed.
6 Problem #1 is presented	Because it is impossible to read Michael's answers from this distance, following each problem you will be told whether or not

Video-Tapes III and IV: Adult Pupil (Continued)

<table>
<tr><th>Visual Content</th><th colspan="2">Verbal Content</th></tr>
<tr><td></td><td colspan="2">Michael's solution to the problem was correct.</td></tr>
<tr><td>7 Card showing either "successful" or "not successful"</td><td>Tape III
On problem #1 Michael's answer was incorrect. He was not successful in solving the problem.</td><td>Tape IV
On problem #1 Michael's answer was correct. He was successful in solving the problem.</td></tr>
<tr><td>8 Problem #2 is presented</td><td colspan="2">Each problem involves a statement for which the final item is missing. Michael must choose his answer from the four possible answers given.</td></tr>
<tr><td>9 Card showing either "successful" or "not successful"</td><td>Tape III
On test problem #2 Michael's solution was incorrect. He was not successful in solving the problem.</td><td>Tape IV
On test problem #2, Michael's solution was correct. He was successful in solving the problem.</td></tr>
<tr><td>10 Problem #3 is presented</td><td colspan="2">Though Mrs. Mallet will answer any of Michael's questions, she will not provide him any feedback on his answers until</td></tr>
</table>

Video-Tapes III and IV: Adult Pupil (Continued)

Visual Content	Verbal Content	
	the test is completed.	
11 Card showing either "successful" or "not successful"	Tape III Michael was unable to solve problem #3 correctly. His solution was not successful.	Tape IV Michael was able to solve problem #3 correctly. His solution was successful.
12 Problem #4 is presented	Each problem is presented to Michael on a separate card. He writes his answers on a sheet rather than on the card itself.	
13 Card showing either "successful" or "not successful"	Tape III On problem #4 Michael's solution was correct. He was successful in solving the problem.	Tape IV On problem #4 Michael's solution was incorrect. He was not successful in solving the problem.
14 Problem #5 is presented	Michael is of course aware of the video-tape equipment and agreed to allow the tapes to be used for this purpose.	
15 Card showing either "successful" or "not successful"	Tape III Michael was not able to solve this	Tape IV Michael was able to solve this problem

Video-Tapes III and IV: Adult Pupil (Continued)

Visual Content	Verbal Content	
	Tape III	Tape IV
	problem correctly. His solution was not successful.	correctly. His solution was successful.
16 Problem #6 is presented	This test is not a timed test. Thus Michael is allowed to work through the problems at his own pace.	
17 Card showing either "successful" or "not successful"	Tape III On problem #6 Michael's solution was correct. He solved the problem successfully.	Tape IV On problem #6 Michael's solution was not correct. He did not solve the problem successfully.
18 Problem #7 is presented	The problems are all presented in the same format. That is, each problem requires an answer at the end of the sentence to conclude the problem. These problems were drawn from a larger pool of problems.	
19 Card showing either "successful" or "not successful"	Tape III On problem #7 Michael's answer was incorrect. He was	Tape IV One problem #7 Michael's answer was correct. He was successful in solving

Video-Tapes III and IV: Adult Pupil (Continued)

Visual Content	Verbal Content	
	Tape III not successful in solving the problem.	the problem.
20 Problem #8 is presented	As you can see, the problems are a mixture of verbal problems, numerical problems, and geometric problems.	
21 Card showing either "successful" or "not successful"	Tape III On problem #8 Michael was successful in solving the problem. His answer was correct.	Tape IV On problem #8 Michael was not successful in solving the problem. His answer was incorrect.
22 Problem #9 is presented	This test is only one of several tests which Michael will complete.	
23 Card showing either "successful" or "not successful"	Tape III On problem #9 Michael was successful in solving the problem. His answer was correct.	Tape IV On problem #9 Michael was not successful in solving the problem. His answer was incorrect.
24 Problem #10	Problem number 10 is the final problem in this portion of the testing.	

Video-Tapes III and IV: Adult Pupil (Continued)

Visual Content	Verbal Content: Tape III	Verbal Content: Tape IV
25 Card showing either "successful" or "not successful"	On problem #10 Michael's answer was correct. He was successful in solving the problem.	On problem #10 Michael's answer was incorrect. He was not successful in solving the problem.
26 Michael puts his name on the paper	Following a brief break Michael will go on to the next portion of the testing.	
27 Blank screen	You will now be presented with a set of questionnaires about the video-tape you have just seen.	

End of Tape

APPENDIX E

QUESTIONNAIRE

A STUDY OF OBSERVING
PUPIL BEHAVIOR

QUESTIONNAIRE

INDEX OF QUESTIONNAIRES

Part I: Personal Information Questionnaire

PartII: Pupil Performance Questionnaire

Part III: Concerns About Teaching Questionnaire

Part IV: Events Pattern Scale

Part V: Interpersonal Role Analysis Scale

Part VI: Your Comments About The Study

GROUP NUMBER____________________

PART I

PERSONAL INFORMATION QUESTIONNAIRE

3.

__INSTRUCTIONS__: Mark an X in the appropriate box or boxes.

1. Age:
16-20 ☐
21-25 ☐
26-30 ☐
31-35 ☐
36-40 ☐
41-45 ☐
45-50 ☐
50+ ☐

2. Sex:
Male ☐
Female ☐

4. Type of Program:
B.Ed. ☐
After Degree ☐
Graduate Diploma ☐
M.Ed. or Ph.D. ☐

5. Year of Program:
1st ☐
2nd ☐
3rd ☐
4th ☐

3. Experiences with children:
none
part-time jobs (play grounds, babysitting etc.) ☐
student teaching ☐
full time teaching ☐
children of your own ☐

PLEASE BE SURE YOU HAVE ANSWERED ALL THE QUESTIONS.

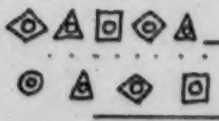
PLEASE GO ON TO THE __PUPIL BEHAVIOR QUESTIONNAIRE__.

PART II

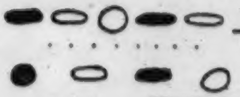
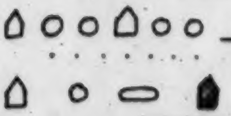
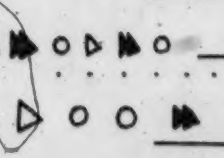
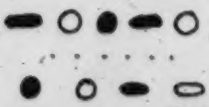
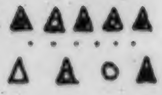
PUPIL PERFORMANCE QUESTIONNAIRE

INSTRUCTIONS:

You have seen a pupil solving a series of problems. In addition, you have seen the problems which were presented to him and you were shown whether he was successful or not in solving each problem. The following ten problems are similar to the problems which you viewed on the videotape. From what you have seen, predict the pupil's success or lack of success on the following problems by putting an X in the appropiate box beside each question. In addition, circle the number which indicates the degree of confidence with which you have made your prediction.

PROBLEMS	PREDICTION		DEGREE OF CONFIDENCE
	SUCCESSFUL	NOT SUCCESSFUL	NOT AT ALL CONFIDENT VERY CONFIDENT
1. □○△▭□○△ ____. □ ○ △ ▭			1 2 3 4 5
2. ●▶○▷● ____. ○ ▲ ▶ ●			1 2 3 4 5
3. ⬭⬬△▲⬭ ____ ⬭ ⬬ ▲ △			1 2 3 4 5
4. 			1 2 3 4 5
5. □△△□△ ____ □ △ ◇ ⬭			1 2 3 4 5

6

PROBLEMS	PREDICTION SUCCESSFUL	 NOT SUCCESSFUL	DEGREE OF CONFIDENCE NOT AT ALL CONFIDENT — VERY CONFIDENT
6.  ____.			1 2 3 4 5
7.  ____			1 2 3 4 5
8.  ____.			1 2 3 4 5
9.  ____.			1 2 3 4 5
10.  ____			1 2 3 4 5

PART II

PUPIL PERFORMANCE QUESTIONNAIRE

5

INSTRUCTIONS:

You have seen a pupil solving a series of problems. In addition, you have seen the problems which were presented to him and you were shown whether he was successful or not in solving each problem. The following ten problems are similar to the problems which you viewed on the videotape. From what you have seen, predict the pupil's success or lack of success on the following problems by putting an X in the appropiate box beside each question. In addition, circle the number which indicates the degree of confidence with which you have made your prediction.

PROBLEMS	PREDICTION		DEGREE OF CONFIDENCE	
	SUCCESSFUL	NOT SUCCESSFUL	NOT AT ALL CONFIDENT	VERY CONFIDENT
1. Find is to seek as hear is to ______. locate retrieve look listen			1 2 3 4 5	
2. Chair is to table as ship is to ______. dock water mast boat			1 2 3 4 5	
3. Window is to pane as wall is to ______ frame door sash panel			1 2 3 4 5	
4. Loaf is to slice as plank is to saw hammer pirate board			1 2 3 4 5	

PROBLEMS	PREDICTION		DEGREE OF CONFIDENCE	
	SUCCESSFUL	NOT SUCCESSFUL	NOT AT ALL CONFIDENT	VERY CONFIDENT
5. Alberta is to county as Edmonton is to ______. township city state parish.			1 2 3 4 5	
6. Beach is to sand as ocean is to ______. waves water blue shiny			1 2 3 4 5	
7. Finite is to infinite as $\frac{1}{2}$ is to ______. $\frac{1}{0}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{1}{10}$			1 2 3 4 5	
8. is to □ as □ is to ______. Δ ▭ —			1 2 3 4 5	
9. Hop is to jog as leap is to ______. jump fast run totter			1 2 3 4 5	
10. A room is 10 feet by 10 feet. Then the floor area is to 100 as the total volume is to ______ 100 10 1000 Cubed			1 2 3 4 5	

INSTRUCTIONS:

On the video-tape you observed a pupil attempt to solve ten problems. How many out of ten did the pupil solve successfully? Circle your answer.

0 1 2 3 4 5 6 7 8 9 10

INSTRUCTIONS:

Based on your observations of the pupil, circle the number which you believe best indicates the pupil's ability.

very low ability — average ability — very high ability

0 1 2 3 4 5 6 7 8 9 10

With what degree of confidence have you made this estimate of the pupil's ability? Circle the appropriate number.

not at all confident — very confident

0 1 2 3 4 5

INSTRUCTIONS:

Put an X beside the sentence which you believe best describes how hard the pupil was trying during the test.

☐ He didn't seem to try at all.

☐ He seemed to be trying most of the time.

☐ He was trying at the beginning but not at the end.

☐ He was not trying at the beginning but was trying at the end.

☐ He seemed to be trying hard throughout the test.

INSTRUCTIONS:

In a few sentences, describe any of the pupil's behavior which you feel should be mentioned but which was not covered in the questions above.

(more space is provided on the next page)

PLEASE GO ON TO THE CONCERNS ABOUT TEACHING QUESTIONNAIRE.

PART III

CONCERNS ABOUT TEACHING QUESTIONNAIRE

INSTRUCTIONS:

As a teacher there are many areas of your professional development which may concern you. The following check list focuses on areas which may currently be or may at one time have been a source of professional concern, attention, or preoccupation to you. Please categorize each area as it applies to you by placing a check mark in the appropriate column.

	a major concern when I started teacher education	a major concern at one time but not now	a major concern now	never a major concern
1. developing effective teaching approaches to the topic				
2. increasing my knowledge in the subjects				
3. establishing my authority with the students				
4. challenging the brighter students				
5. working to bring about curriculum changes in the elementary school				
6. designing good exercises and test questions				
7. developing a good attitude toward school in the pupils				
8. adapting existing materials to the level of the class				

	AT first	at one time	now	never
9. maintaining classroom order and control				
10. understanding the learning problems of individual students				
11. motivating the class to learn what is intended				
12. designing effective materials and activities				
13. becoming familiar with the resources and equipment available				
14. involving the slower students in what is intended				
15. understanding the learning process in children				
16. developing adequate subject matter background				
17. management- getting the class to do what I intend				
18. efficient lesson organization and development				
19. becoming familiar with newly developed programs and materials				
20. sharing my experiences and ideas with others to bring about changes in teaching				

PLEASE FEEL FREE TO COMMENT FURTHER.

PLEASE GO ON TO TH EVENTS PATTERN SCALE.

PART IV

EVENTS PATTERN SCALE

NOTE: Please read the instructions carefully before proceeding to complete the tasks asked of you for this questionnaire.

INSTRUCTIONS:

Introduction: This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered 'a' or 'b'. Please select one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you would like to be true or the one you think you should choose. This is a measure of personal belief; there are no right or wrong answers.

To select the statment you believe to be more true in each of the 29 pairs of statements, simply circle the appropriate letter on the right of each of the 29 items. But first , an example to help clarify these instructions. An item which can be used to illustrate this procedure is as follows:

Sample item:

(a) I usually get my own way in what I do. A

(b) Many times, things do not turn out the way I want. B

If you believe (b) to be more true as far as you are concerned, then you would circle the B in the space on the right side of the item.

Please proceed now to complete the 29 items.

1.(a) Children get into trouble because their parents punish them too much. A

(b) The trouble with most children nowadays is that their parents are too easy with them. B

2.(a) Many unhappy things in people's lives are partly due to bad luck. A

(b) People's misfortunes result from the mistakes they make. B

3.(a) One of the major reasons why we have wars is because people don't take enough interest in politics.	A
(b) There will always be wars, no matter how hard people try to prevent them.	B
4.(a) In the long run people get the respect they deserve in this world.	A
(b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.	B
5.(a) The idea that teachers are unfair to students is nonsence.	A
(b) Most students don't realize the extent to which their grades are influenced by accidental happenings.	B
6.(a) Without the right breaks one cannot be an effective leader.	A
(b)Capable people who fail to become leaders have not taken advantage of their opportunities.	B
7.(a) No matter how hard you try some poeple just don't like you.	A
(b) People who can't get others to like them don't understand how to get along with others.	B
8.(a) Heredity plays the major role in determining one's personality.	A
(b) It is one's experiences in life which determine what they're like.	B
9.(a) I have often found that what is going to happen will happen.	A
(b) Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.	B

10.(a) In the case of the well prepared student there is rarely if ever sich a thing as an unfair test.	A
(b) Many times exam questions tend to be so unrelated to course work that studying as really useless.	B
11.(a) Becoming a success is a matter of hard work, luck has little or nothing to do with it.	A
(b) Getting a good job depends mainly on being in the right place at the right time.	B
12.(a) The average citizen can have an influence in government decisions.	A
(b) This world is run by the few people in power, and there is not much the little guy can do about it.	B
13.(a) When I make plans, I am almost certain that I can make them work.	A
(b) It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.	B
14.(a) There are certain people who are just no good.	A
(b) There is some good in everybody.	B
15.(a) In my case getting what I want has little or nothing to do with luck.	A
(b) Many times we might just as well decide what to do by flipping a coin.	B
16.(a) Who gets to be the boss often depends on who was lucky enough to be in the right place first.	A
(b) Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.	B

17.(a) As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.	A
(b) By taking an active part in political and social affairs the people can control world events.	B
18.(a) Most people don't realize the extent to which their lives are controlled by accidental happenings.	A
(b) There really is no such thing as "luck".	B
19.(a) One should always be willing to admit mistakes.	A
(b) It is usually best to cover up one's mistakes.	B
20.(a) It is hard to know whether or not a person really likes you.	A
(b) How many friends you have depends upon how nice a person you are.	B
21.(a) In the long run the bad things that happen to us are balanced by the good ones.	A
(b) Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.	B
22.(a) With enough effort we can wipe out political corruption.	A
(b) It is difficult for people to have much control over the things politicians do in office.	B
23.(a) Sometimes I can't understand how teachers arrive at the grades they give.	A
(b) There is a direct connection between how hard I study and the grades I get.	B

24.(a) A good leader expects people to decide for thenselves what they should do.	A
(b) A good leader makes it clear to everybody what their jobs are.	B
25.(a) Many times I feel that I have little influence over the things that happen to me.	A
(b) It is impossible for me to believe that chance or luck plays an important role in my life.	B
26.(a) People are lonely because they don't try to be friendly.	A
(b) There's not much use in trying too hard to please people, if they like you, they like you.	B
27(a) There is too much emphasis on athletics in high school.	A
(b) Team sports are an excellent way to build character.	B
28.(a) What happens to me is my own doing.	A
(b) Sometimes I feel that I don't have enough control over the direction my life is taking.	B
29.(a) Most of the time I can't understand why politicians behave the way they do.	A
(b) In the long run the people are responsible for bad government on a national as well as on a local level.	B

PLEASE GO ON TO THE INTERPERSONAL ROLE ANALYSIS SCALE.

PART V

INTERPERSONAL ROLE ANALYSIS SCALE

__NOTE__: Please read the instructions carefully before proceeding to complete the tasks asked of you in this questionnaire.

INSTRUCTIONS:

Introduction; On the last page of this particular questionnaire there is a 10 by 10 grid. Each of the ten columns in the grid is identified by the name of a particular role type which represents an actual person whom you yourself now know or have known at some time in your life. Obviously, column number 1 represents yourself, column number 3 (mother) and 5 (father) represent a specific person who is or has been part of your social environment. Identification of the other specific persons (eg. number 6: "friend of the same sex") is up to you.

Part I: The first task we are asking of you is to take a few minutes to identify the specific persons you will use as the focus of this role analysis. If you like, jot down their initials next to the role title so as to assist you in focusing on them. (For example, if the "person you dislike" is named John Jones, you could put the initials J.J. next to column two.) N.B. For "boss" you may want to think of a school principal or the actual boss in a part-time summer job.

Part II: Now that you have identified a specific person for each of the ten roles, would you please look at the information to the right of the 10 by 10 grid. This is the part of the interpersonal analysis scale which enables you to rate each of the persons identified on the grid. For each person it is possible to provide a rating on each of the ten pairs of terms describing personal characteristics. In each case, the rating can range from +3 to -3. For example, if you see yourself as being very outgoing you would write the number + 3 in the column under the role title number 1 (yourself). If you rate person number 2 as shy, you would write -3 under the column number 2. If you rate person number 6(friend of same sex) as "very considerate", you would write a +3 under column number 6 and in the eighth row of the grid, that is opposite the "considerate-inconsiderate" scale.

By carrying out this procedure for each of the 10 persons and each of the 10 characteristics, you will be able to complete all 100 of the cells in the grid. The numbers +3, +2, +1, -1, -2, -3 are simply designed to help you estimate and to record the degree to which each of the 10 persons possesses the characteristics represented by the 10 pairs of terms.

When the grid is complete, this particular questionnaire is complete.

PLEASE GO ON TO THE COMMENTS ABOUT THE STUDY QUESTIONNAIRE

INTERPERSONAL ROLE ANALYSIS SCALE

ROLE DESCRIPTIONS	1. YOURSELF	2. PERSON YOU DISLIKE	3. MOTHER	4. PERSON YOU'D LIKE TO HELP	5. FATHER	6. FRIEND OF SAME SEX	7. FRIEND OF OPPOSITE SEX (OR SPOUSE)	8. PERSON WITH WHOM YOU FEEL MOST UNCOMFORTABLE	9. BOSS	10. PERSON DIFFICULT TO UNDERSTAND
INITIALS										

CHARACTERISTICS

	+3	+2	+1	-1	-2	-3	
outgoing							shy
adjusted							maladjusted
decisive							indecisive
calm							excitable
interested in others							self absorbed
cheerful							ill humoured
responsible							irresponsible
considerate							inconsiderate
independent							dependent
interesting							dull
	+3	+2	+1	-1	-2	-3	

PART VI

YOUR COMMENTS ABOUT THE STUDY

Please feel free to comment here about any of the parts of this study and your general reaction to the procedures used (the video-tape, the questionnaires etc.).

PLEASE PLACE THE COMPLETED QUESTIONNAIRES IN THE ENVELOPE PROVIDED AND SEAL THE ENVELOPE. THANK YOU FOR YOUR TIME.

APPENDIX F

SCORING SHEET FOR STAGE OF PROFESSIONAL DEVELOPMENT

Frequency Profile

	Stage 1	Stage 2	Stage 3	Totals
A major concern at first				
A major concern at one time				
A major concern now				
Never a major concern				
Totals				

APPENDIX G

INFORMATION PRESENTED WHEN SOLICITING VOLUNTEERS

Initial Contacts With Students to Solicit Volunteers

I Information about self:

My name is Susan Therrien and I am currently a graduate student in elementary education. The research project which I will be describing to you will form the basis of my thesis. This first stage will provide me the basic information I need to write the thesis.

II The study:

The study itself involves an examination of the ways in which teachers view pupil behavior. I'm interested in knowing more about the different ways in which a pupil's behavior may be interpreted by teachers and it is for this part of the study I need your help.

I am contacting each group of elementary education students registered in C. and I. courses, and asking them to volunteer for the study. Then from the volunteers, I will randomly select 60 students to participate. By selecting the participants randomly, I will be able to ensure to some degree that the wide variety (differences in age, personality, sex, experiences with children etc.) have had equal chance of entering into the results of the study, even though it would have been impossible to test all of those differences and design them deliberately into the study.

III What I am asking of you:

I am asking for as many of you as possible to volunteer to participate in the study. If you are part of the randomly selected group, you will meet for about one hour on Thursday, May 29 at

4:00 p.m. During the hour you will view a ten minute video tape of a pupil involved in solving some problems. Following the tape you will be asked to fill out a questionnaire about the tape and about yourself. The questions about yourself will include such things as whether or not you've had teaching experience, whether you have children of your own etc. You will not be asked to put your name on the questionnaire and your name will not appear in the write up of the results. All of you can participate in the study at the same time even though you will not all be viewing the same pupil. Different groups will be in different rooms. You will not need to do any preparation or bring anything with you. I'll not only supply free pencils but free coffee and doughnuts!

IV In return, what benefits will you receive

You will have been a participant in on going research which could eventually provide information for improving teaching in general. Once I have compiled the information from the questionnaires, I will provide each participant with a summary of the results (upon request) so that you will have a more total picture of the study itself. In addition, the tapes show pupils involved in interesting problem solving activities and I think you'll enjoy viewing them.

V Any questions about the procedures:

Before I pass out the sheets for you to check off whether you will volunteer, are there any questions about the procedures?

VI Pass out sheets

Check the appropriate information. Place the sheet in the envelope provided and bring to me. I will be back Thursday of this week to let you know the specific time and date.

APPENDIX H

FORMS AND LETTERS USED IN SOLICITING VOLUNTEERS

Information for Spring Session Staff

Thank you for permitting me to attend your class to contact students for my study. I will come to room ___ on May ___, at ____, and will need about ten minutes of class time.

After explaining the study briefly to your class and answering any questions the students may have, each student will have an opportunity to volunteer to participate in the study using the individual forms provided to them (see sample attached). Since I will collect the forms in envelopes, students may make their choices anonymously. Should any student wish to think over his decision, I will return the following day to receive any outstanding envelopes.

The sampling will be completed by noon on Wednesday, May 28, and I would like to return to your class on that afternoon or Thursday morning to distribute envelopes to your students containing information as to time, date, and place. Each student who volunteered for the study will be provided with a written summary of the results later in the summer, if they wish.

The initial summary and analysis of the data should be ready before the end of spring session. If you are interested and if time permits, I would be happy to arrange a time to explain the study to your class.

I have enclosed a very brief overview of the study for your information. Please refrain from discussing this information with your students before or during the study. This will enable me in some way to standardize the explanations to each group. Thank you again for your help.

Sincerely
Susan Therrien

Form #1

Volunteer Form

This is a study of how teachers view pupils' behavior. The study will involve about one hour of your time on Thursday, May 29, at 4:00 p.m. During the hour, you will view a video-tape of a pupil, and then answer a questionnaire about the tape and about yourself. At no time will your name appear on your questionnaire or in any part of the study report.

Please indicate whether you would be willing to participate.

☐ I would be willing to participate in the study.

Name ____
Spring session course number ______________________
Edmonton address ________________________________
Edmonton phone _________________________________

☐ I would not be willing to participate in the study.

Please place this form in the envelope provided. Thank you.

Overview of the Study

The Nature of the Study

The study is entitled Teachers' Attributions of Children's Abilities. The research will involve the examination of subjects' responses on questionnaires following the viewing of video-tapes showing pupils engaged in problem solving tasks. I will be attempting to examine the ways in which the subjects attribute certain abilities to pupils based on the behavior of the pupils in a given situation.

The Sampling Procedures

I will be soliciting volunteers from among students enrolled in Spring Session C.I. courses in Elementary Education. From the pool of volunteers, I will draw a random sample of 60 subjects. It is my hope that all students will be interested in participating.

The Degree of Involvement of the Subjects

Subjects will meet for one hour on Thursday, May 29, at 4:00 p.m. The time will not conflict with their class time, nor will it be late in the session thus conflicting with exam preparation. Subjects will view a video-tape, following which they will complete a questionnaire concerning the tape and themselves. They will remain anonymous throughout the study.

Study Participant Form

Form #2

Name ____

You have been selected as one of 60 students to participate in this study. Thank you for volunteering your time.

Please come to room ____________

on ____________

at ____________

The number in the box at the tope of the page designates the group to which you have been assigned. That is, the video-tape which you will view will be displayed in a room marked with the same code number.

PLEASE BRING THIS SHEET WITH YOU.

Should you require any further information please call me at my office (432-3840) or at home (465-6772).

Again, thank you for agreeing to participate.

Sincerely

Susan Therrien

Non-Participant Form

Form #3

Name ____

Thank you for volunteering to participate in the study. Your name was not selected through the random procedures used, and thus your time will not be required.

I appreciate your willingness to participate. If you would like to have a copy of the results of the study mailed to you, please fill in your permanent mailing address below and return to me. I should have the results ready during the summer months and I would be happy to send you a copy.

Again, thank you.

Sincerely

Susan Therrien
Office #251 B (Ed. I)

I would like a copy of the results.

Name ______________________________
Address ______________________________
City or town ______________________________
Province ______________________________

APPENDIX I

DEBRIEFING SCHEDULE

Debriefing Schedule

1. Description of the four tapes.
2. Description of primacy effect on prediction, recall, and estimates of ability.
3. Description of individual measures and their purpose in the study.
4. Invite questions and comments.

APPENDIX J

SAMPLE DESCRIPTION: FREQUENCY TABLES

Age Frequencies

	TREATMENT GROUP				
AGES	I	II	III	IV	Total
50 +	0	0	1	2	3
46 - 50	1	2	0	0	3
41 - 45	1	1	0	3	5
36 - 40	0	1	0	0	1
31 - 35	2	3	0	1	5
26 - 30	0	1	4	1	6
21 - 25	7	6	6	5	24
16 - 20	2	0	1	1	4

Sex Frequencies

	TREATMENT GROUP				
	I	II	III	IV	Total
male	6	3	0	0	9
female	7	11	11*	13	42

*response omitted by one subject.

Experience Frequencies

	TREATMENT GROUP				
	I	II	III	IV	Total
own children and/or full time teaching	4	9	5	8	26
student teaching	8	5	7	4	24
casual work experience related to children	1	0	1	1	3
none	0	0	0	0	0

Type of Program

	TREATMENT GROUP				
	I	II	III	IV	Total
B. Ed.	12	11	9	10	42
P.D.A.D.	1	0	1	2	4
Grad. Dip.	0	0	1	1	2
Graduate	0	3	1	0	4

APPENDIX K

CORRELATION MATRIX

Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Age		-.088	.760^{b}	.152	-.172	.02	.075	-.001	.026	.056	-.337^{a}	-.130
2 Sex			-.023	-.567^{b}	.259	.099	.017	.044	-.186	-.176	-.051	-.207
3 Experience				.212	-.217	-.106	.010	.168	.168	-.069	-.230	-.047
4 Type of Program					-.608^{b}	.011	.063	.020	.215	.155	.106	.202
5 Year of Program						.071	-.086	.040	-.074	-.000	-.022	-.228
6 Susceptibility to Primacy (Prediction)							.131	-.088	-.423^{b}	.066	-.032	.307^{a}
7 Confidence								-.038	-.029	.187	-.048	-.266^{a}
8 Susceptibility to Primacy (Recall)									.201	-.093	.013	.128
9 Susceptibility to Primacy (Estimate of Ability)										.064	-.163	-.029
10 Motivation Estimate											-.174	-.294^{a}
11 Locus of Control												.182
12 Cognitive Complexity												

$^{a}p < .05$

$^{b}p < .01$

APPENDIX L

DISTRIBUTION OF COGNITIVE COMPLEXITY SCORES

Cognitive Complexity Scores

total possible score = 450 N = 51*

mean = 290.574 S.D. = 68.096 range = 9 to 360

(*One subject did not complete the questionnaire)

	TREATMENT GROUP				
Frequency C.C. Score	I	II	III	IV	Total
0 - 50	0	0	1	0	1
51 - 100	0	0	0	0	0
101 - 150	0	0	0	0	0
151 - 200	0	0	0	1	1
201 - 250	1	0	1	1	3
251 - 300	3	6	3	6	18
301 - 350	9	8	6	4	27
351 - 400	0	0	1	0	1
401 - 450	0	0	0	0	0

APPENDIX M

DISTRIBUTION OF LOCUS OF CONTROL SCORES

Locus of Control Scores

total possible score = 23 N = 52

mean = 9.846 S.D. = 3.939 range = 2 to 20

	TREATMENT GROUP				
Scores	I	II	III	IV	Total
0 - 4	1	1	0	1	3
5 - 8	2	6	7	3	18
9 - 12	5	3	3	9	20
13 - 16	4	1	2	0	7
17 - 20	1	3	0	0	4
21 - 24	0	0	0	0	0